American BEE JOURNAL

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Fall Management Round-up

"The Sweetest Story Ever Told"

Individual beekeepers, associations, the American Honey Institute and the American Beekeeping Federation as well as the food industry and PMA will join throughout October to tell consumers of America "The Sweetest Story Ever Told." Food trade associations, retailers, restaurants, wholesalers, brokers and allied industries are all aware of the honey promotion program for October and are showing enthusiastic cooperation. As Art Kehl, member of the Federation Marketing Committee, says: "Your honey sales during October will be twice as much as any other month if you will but see to it that every one of your grocery stores has an ample supply to build a mass display."

The beekeepers' job is not hard but it is important. It is simply to see that honey is available to stores during October and to promote the consumption of honey in every way possible.

The American Honey Institute is stepping up its regular, unexcelled job of honey promotion in contacting home economists and food editors and in supplying point-of-sale material.

The Federation is working to build a promotional and marketing program through state and local beekeepers' associations and to create a stepped-up distribution and sales program for October through packers of all kinds.

Beekeepers' associations are helping the program by building displays, taking part in radio and television programs, and in some cases, providing money for display pictures to be used in food trade journals.

Individual beekeepers are appearing on programs, advertising in local papers and on the radio, planning displays and demonstrations of bees and honey, and talking honey to everyone.

Beekeepers are interested in knowing just how the PMA is managing their part of this campaign and what the results are so far. In a meeting September 4 in Chicago, three members of the Federation, Roy Grout, Glenn Jones and Art Kehl, discussed the program with five officials of PMA. These men were G. Chester Freeman, Food Trades Division director, Oscar F. Beyer, supervisor of the Chicago PMA office, and his assistants, Mr. Janus, Mr. Patterson and Mr. Means. Here are the contacts PMA has made:

On the national level: All contacts planned have been made and the honey promotion for October has been received with enthusiasm. Here are a few highlights—National Food Chains organization has approved the October program, thus bringing into it many food chains which might not have backed the program otherwise — National Association of Retail Grocers will have a 2-column picture of honey displays and an article in their September magazine —Super Market Merchandising magazine for August carried a full page story — other publications carrying stories and announcements are Progressive Grocer, World Telegram, Wall Street Journal, Extension News (to every extension worker in the country), Bakers Weekly, Quality Grocer, Bakers Review, American Hotel Association bulletin, and Ladies Home Journal publication "The Bellringer" which goes to 32,000 grocery stores, as well as the Journal itself.

Others cooperating on the national level are the Great Atlantic & Pacific Tea Co., Safe Way Chain, Krogers, National Biscuit Company which will feature honey on its Arthur Godfrey T-V and radio programs, Bond Bread (Hopalong Cassidy program), Quality Bakers of America, Sunshine Biscuit Co. (ad in Look Magazine, August 12), International Association of Ice Cream Manufacturers (to feature honey topping to its 76,000 retail distributors) and the Cereal Institute which sent out 1500 releases to press and radio featuring honey and cereals in September for Better Breakfast Week.

On the local level: Mr. Freeman's men are working with brokers to get them to help set up large displays of honey in food stores. These displays have been photographed and are being used as cover pages for food trade journals in many parts of the country.

Practically all state and local retail grocers association publications have carried or will feature articles on honey, many with display pictures. The PMA reports that they will not be able to tabulate the number of radio, T-V and news articles to be devoted to honey promotion. They will be legion. A few are: Milwaukee Wise station WTMJ-TV on October 16 will have a 32-minute program devoted to honey uses. Omaha's KMTV will spot demonstrate honey with Glenn Jones as guest on a 15-minute program October 27. WOW-TV "Martha's Kitchen Program" will use honey recipes all during October. In Atlanta, the Ruth Kent show on WSB-TV, will feature honey and biscuits on September 30.

Chicago regional contacts: In the nine states under the jurisdiction of the Chicago PMA office, contacts have been made with the food trade, restaurant groups, bakeries, T-V, radio, press, beekeepers' associations and many other organizations concerned with food distribution. Here are a few samples: H. P. Law Company, Lincoln, Nebraska, a wholesale grocer with some 150 member stores, will send out a coupon to customers good for 10 cents on the purchase of a 1-pound jar of honey. They have ordered 500 cases or 12,000 jars of honey and expect to move this amount in one week.

WGN-TV, channel 9, had a full hour program called "Honey Hour" on September 29 from 9:30 to 10:30 A.M. On their program called "Chicago Cooks with Kay Middleton" they will use honey recipes at least once a week during October.

Kresge's State Street store in Chicago will have a live bee display in the window and will feature honey in all their stores in the Chicago district.

WWJ-TV, Detroit, will feature Jean McBride using honey in novel ways during October. In St. Louis several spots will be obtained on T-V, and Kroger, A & P and General Grocers with 876 stores are cooperating with large honey displays.

The other four regional PMA offices are getting similar results. Following the October promotion, a report will be made of the activities and results and this information will be available to the Federation and other groups.

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THE AMERICAN BEE JOURNAL

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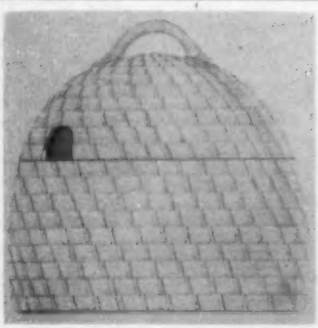
Contents

Our Cover Picture

Edgar Abernethy, Stanley, North Carolina, sent us this picture in 1943 and it was used as a full page feature page break in November of that year. It seems to symbolize this month of October. Somehow shocked corn goes with fall management, feeding, packing, getting ready for winter. Fall management and wintering are woven into one "Round-up" in this issue.



Food for Thought

They All Love Honey

(The following is an editorial reprinted from Bakers Weekly, August 4, 1952, page 29. This is an example of the publicity honey is receiving in publications of the food industry. We would like to express the appreciation of all beekeepers for this publicity and help in the October program.—Ed.)

The American Beekeeping Federation is moving into high gear with its promotion program for honey, to be climaxed by nationwide observance of October as Honey Month. The Department of Agriculture's Production and Marketing Administration is serving as a benevolent — and practical-minded — sponsor.

Two points strike us as worthy of note. One is the fact that a government agency has undertaken a working alliance with industry in a program that benefits the general public. Second, that agency frankly states that its objective is to promote the movement of this particular commodity through normal trade channels, rather than accept the alternative possibility of having a surplus which it would have to purchase under price-support regulations and dispose of to institutions, school-lunch programs and other recipients.

Moreover, the experts tell us that the production of honey itself is actually secondary in economic importance to the pollination activities of our busy bees. No less than 50 crops are dependent on the pollination that only a thriving bee population can produce. In fact, in some agricultural areas, beekeepers are actually paid for the service their colonies render in this respect.

No one will question the soundness of these objectives. Bakers will ask only how they can cooperate to mutual advantage. In certain types of special breads and sweet doughs, cookies and hard sweets, honey can be used to advantage, for flavor and for universal sales appeal. Effective tie-in advertising on such combinations as toast and honey should help step up consumption of both. Wholesale bakers can give their merchandising ingenuity a real workout by suggesting companion-displays of bread and honey to grocers, while retailers and house-to-house operators can play up similar ideas in their own way.

We'll have some practical suggestions for our readers along these lines in forthcoming issues. Meanwhile, we suggest our readers keep in mind that October will be Honey Month and start preparing to take full advantage of the national publicity.

Beekeeping Proficiency

There has recently come to our desk a booklet on "Prospectus of Examinations for Proficiency in Apiculture", published by the British Beekeepers' Association. According to the Secretary, Mr. J. H. Armitt, some 300 applications and examinations are given each year.

These examinations range from Junior and Preliminary examinations through Practical, Intermediate and Senior examinations, leading to titles of Master Beekeeper or Practical Beekeeper. Then the Judging examination will graduate you as B.B.K.A. Show Judge; the Lecturers' examination to Lecturer of B.B.K.A.; and finally, a passed Fellowship examination makes you a Fellow of the British Beekeepers' Association.

We could well use at least two of these examinations and titles if not all of them. We refer to the difficulty in getting competent judges for our numerous fairs. A pool of qualified judges would be quite desirable. But, of course, with it must come some uniformity in judging and grading rules for displays and exhibits. Hardly two states have the same rules, and the divergence is still greater in our smaller fairs.

Perhaps that is one reason why we in the United States are such poor exhibitors and supporters of honey and beeswax displays. We have nothing, for instance, which can approach the Canadian National Exposition and Royal Winter Fair with their wonderful exhibits of honey and beeswax from all the provinces of Canada. Yet honey and beeswax displays are as necessary an adjunct to a complete promotion and publicity program as are other phases of advertising.

October -- Honey Month -- Is Here!

Here we are! October is here with a whole month of honey promotion which will climax with National Honey Week—the last week of the month. Listen to your radio and TV programs—many will mention honey. Watch your newspaper and magazines for articles and illustrations featuring honey. Look for the honey displays in the food stores across the country. Bakers, druggists, restaurants and hotels have been asked to aid in promoting honey all during October.

Do this so that you will know the results of the extensive work that has been going on. This was lead by the Government but it was **your program and mine** aided by the American Honey Institute and the American Beekeeping Federation—by state and local beekeepers' associations. **For this is the type of promotion we must put on every year during HONEY MONTH and NATIONAL HONEY WEEK!**

But this is only the start of October—the beginning of HONEY MONTH! Each and every one of us, at the very least, can tell someone each day how good honey is, how delicious as a spread on toast or pancakes, what a wholesome energy food it is for our youngsters. Each day do at least one thing to influence the consumption and sale of one pound of honey.

Ask your grocer about his stock and honey display. If he does not have an effective, large display, help him arrange one in a prominent spot. Ask for honey in your restaurant or hotel. Ask for a honey topping on your ice cream sundae. Ask for honey bread and other honey bakery products. **Let's personally help make America honey-conscious daily during October!**

We predict that October—Honey Month and National Honey Week—will bring publicity and promotion worth more than a million dollars to the beekeeping industry. We predict that the industry will see the greatest sale of honey that it has ever experienced.

Fall Management Round-up

The Behavior of Wintering*

by Dr. V. G. Milum
Apiculturist
University of Illinois

BECAUSE of editorial decree on space limitations, my statements must be confined to what I think are the essential facts. These are based upon the findings of others and my own observations.

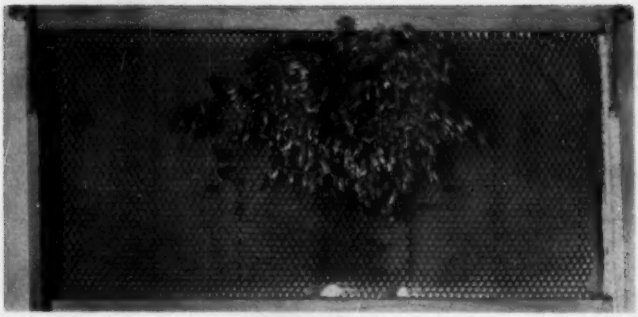
Probably the first to use thermocouples for studying the temperatures of winter clusters of bees were Phillips and Demuth in 1912-1913.** They concluded that when the lowest point among the bees reaches a temperature of "57° F., the bees begin to form a compact cluster, and if the temperature of the air surrounding them continues to drop, they begin to generate heat within the cluster, often reaching temperatures considerably higher than those at which they were formerly quiet and satisfied." After the cluster is once formed, they indicated an inverse relation between the changes in temperature within the cluster and the changes in the outside temperature; i.e., with a rise in the outside temperature, the temperature of the interior of the cluster decreases, and vice versa, except when the colonies are stimulated to flight or are disturbed. Another exception occurs when a cluster is not able to obtain sufficient stores to maintain heat production.

Thus a colony of bees is able to survive periods of cold weather by forming a compact spherical cluster with individual bees crawling into empty cells with a questionable insulating band of tightly packed bees on the outer edge. Within are spaces in which workers create heat by muscular activity, including rapid respiration, fanning of wings, and a general shifting of their bodies from side to side. Certain special communication dances executed by workers (the grooming invitation and the spirit or tap dances) also produce heat but they are not primarily performed for that purpose. In order to produce heat by muscular activity, the workers must have access to supplies of honey or stored sugar sirup. The ideal situation is to have these carbohydrate stores located above the greater portion of the clustering space, where the bees at the top, aided by the heat passing upward from the cluster, are able to reach this available supply and move it inside to the heat producing bees. Honey in the combs at the side of the cluster is of no value in a long continued period of cold weather for the bees in the edge of the cluster cannot pass the honey through the combs to the bees in the center who serve as a furnace to burn the fuel to keep the cluster warm. Colonies are sometimes found starved and frozen to death, even in central Illinois, when there is honey only above the outer edge of the cluster between two frames. We know of one colony that perished at a cellar temperature of 38° F. Its honey supply was in combs at the sides of the cluster.

A winter cluster is somewhat like an ordinary heating stove in the center of a room. In warm weather it is easy to keep the whole room warm, but in sub-zero weather, the outer edges of the room are cold. Likewise the edges of the cluster are cold and some bees become chilled and eventually die if too long exposed to cold. Even though books have been written with the basic theory that the edge of the cluster is maintained at a temperature of 43-46° F. by an insulating band that prevents the escape of heat, I cannot agree with this idea. This is physically impossible in sub-zero weather, and can be verified by anyone who will take the trouble to remove the cover of a hive and a few hours later examine it when the original disturbance has been forgotten by the bees. He will then find chilled bees on the edge of the cluster and it has been shown that bees chill at a temperature of 41° F. and if too long exposed they eventually

* Contribution from the Entomological Laboratories of the University of Illinois, Urbana, Illinois.

** Phillips, E. F. and G. S. Demuth. 1914. The temperature of the honeybee cluster in winter. U.S.D.A. Bul. 93, pp. 5-6.



Above: Part of a small cluster of bees that died from starvation in cold weather.

Below: The outer edge of a 4-frame cluster that perished during a cold period. Only this portion of the cluster was in contact with honey and the workers could not pass it along to the heat producing bees in the center of the cluster.

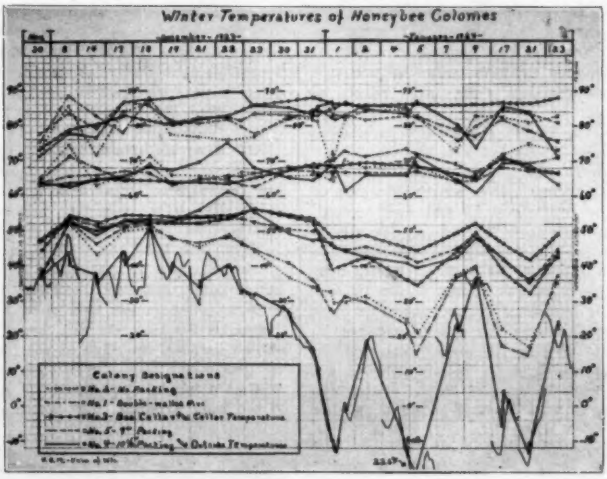
Below: Colony temperatures as reported in Wisconsin Experiment Station Bul. 75. Also in 1928 Illinois State Beekeepers Association Report which contains a complete summary of the literature to that date.

Upper group of lines—Highest temperature of clusters of five colonies.

Group starting at 62 degrees-66 degrees F.—Averages of all points in clusters above 56 degrees F.

Group starting at 44 degrees-47 degrees F.—Average of all points below 56 degrees F. Note: This group includes recording points outside the cluster and many of the colder points in the outer edges of the cluster. Each hive contained a total of 44 thermocouple or temperature reading points.

Lower discontinuous and continuous solid lines—Outside temperature recorded at weather bureau and at location point of experiment, respectively.



die. These chilled bees always have honey in their honey stomachs but it is of little use to them.

While, within certain limits colony clusters expand and contract with changes in outside temperatures, this is only possible in vertical and horizontal directions parallel to the surfaces of the combs. Because of the comb barriers the workers cannot change positions sidewise across the hive from one inter-comb space to another unless the unchilled portion of the cluster extends below or above the combs of a hive body, or it occupies continuous parts of two bodies. (This is essentially the idea expressed by Quinby in 1864, yet disregarded by many modern writers and lecturers on the wintering of bees.)

Probably, the most common error in the literature regarding the winter cluster is one based upon an assumption and since repeated by many others who seem to never have taken the trouble to check. The first writer stated that as long as the bees on the outside of the cluster are able to keep up their body temperatures, they remain outside, but when chilled they pass into the interior. In cold weather he assumed that the interchange would be greater. A chilled bee cannot move in and no sensible bee inside the cluster ever moves out and says "Sister move in, I'll take your place for awhile." The only bees that ever leave a warm cluster surrounded by lower than freezing temperatures or even several higher (probably near the chilling temperature of 41° F.) are those that are suffering from dysentery or other diseases or those of an inquisitive nature that come out to investigate when a colony is disturbed. The inactive bees on the edge of the cluster just stay in position; it's a "hot" bee from inside that ventures forth temporarily. The exploring worker needing a flight will return to within the cluster if it doesn't become chilled. These statements are based upon numerous observations of colony clusters in glass hives or with glass covers so that they could be observed without disturbing them. (See 1944 Gleanings, 72:473-475, 516-518.)

While 46° F. is approximately the outside temperature at which bees start to fly, wind and other weather conditions have some influence. In our own studies we noted at times with an outside temperature of 41° F., the bees seemed to be stimulated,

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Management for Successful Wintering

by Dr. C. L. Farrar
Bureau of Entomology and Plant Quarantine[1], *Agr. Res. Adm., U.S.D.A.*

WINTER, in the mind of man, implies cold weather. To a large degree, winter for the honey-bee colony is any extended period of dearth in both pollen and nectar. The honey-bee colony has the widest possible range of climatic adaptability of any insect species. It survives in nature from the warm tropics to the northernmost regions that permit a pollen- and nectar-producing flora adequate for its food supply.

Winter management presents the problem of insuring adequate food reserves consistent with colony needs. These needs have been determined for most areas by experiences. Too many beekeepers, however, gamble on anticipated resources or fail to provide a margin of safety that will insure good colonies following the most adverse seasons.

The principal cause of winter loss is starvation. Weak colonies, queen failures, bee diseases including Nosema, and factors pertaining to gross mismanagement also take their toll.

The normal, unrestricted colony amply supplied with pollen and honey has the capacity to survive long periods of adversity. In beekeeping practices the standards for a normal colony are considerably different in the warmer than in the colder regions.

In the South the bees do not need to form a tight cluster to maintain favorable temperatures. Colonies with medium or even small populations can survive and may be profitable when there is a long build-up period before production. They usually consume less honey per colony and may winter on 30 to 50 pounds of honey. It is possible that less food would be consumed in producing the required number of bees if half as many strong colonies were wintered with 60 to 90 pounds of honey and large pollen reserves. The plants blooming in "midwinter" that sustain small colonies might permit larger colonies to make substantial gains. By dividing these at the proper time, the required number of good colonies would be available for the main production period.

The standards for a normal colony become more exacting in the northern regions where subzero temperatures express the common concept of a true winter period. The normal, unrestricted colony will have approximately 10 pounds of bees at the close of brood rearing in October. This many bees will densely cover 20 frames of a two-story standard hive having 60 pounds of honey or a gross hive weight of 120 to 130 pounds. The three-story standard hive having a gross weight of 180 pounds or 90 pounds of honey may appear stronger, but it will have about the same number of bees. Colonies wintered with 60 pounds of honey may require additional food in the spring.

The beekeeper can not afford to weigh his bees but, if any colony population is substantially below his best, it must be considered subnormal and a winter risk. Where beekeepers have too few colonies or lack the experience to establish proper standards for comparison, the population density given above is a safe population measure.

Similarly, beekeepers are seldom prepared to weigh all colonies to obtain their gross weight in estimating reserve stores. This can be done by "hefting" the hives from the back after first establishing suitable standards by determining the actual amount of stores in several colonies. These may be weighed or the honey estimated by direct observation of each frame. The equivalent of one full standard frame should not be considered as having more than 5 pounds net honey, since there may be pollen underneath sealed honey. All estimates by direct observation of frames and "hefted" hives are subject to wide errors and must be made conservatively. No loss will result from 30 pounds too much honey, but it may mean a year's crop if there is 1 pound too little.

A colony may be subnormal in strength if restricted by too much honey in the brood chambers. This will result from insufficient brood rearing space due to too few or improper use of supers, some uses of queen excluders, poor queens, or those superseded at certain critical times. It is usually more profitable to unite small or medium-strength colonies to full-strength colonies even though they may occasionally winter well. If they have good queens and are to be wintered, it is recommended that they be reduced to one hive body containing 45 pounds of honey and placed above a full-strength colony. The large and small colonies must be separated by window screening so cleated as to provide free passage between the screen and adjacent frames. Both colonies must have independent flight entrances.

There are other considerations important to good wintering of full-

1 In cooperation with the Wisconsin Agricultural Experiment Station.

strength colonies provided with abundant stores. The stores must be organized in the hive in a manner that will insure the cluster's contact with honey during any period of protracted cold. The top hive body should contain eight fully sealed combs of honey with the center two combs one-half full. It should have 45 pounds of honey but with a small amount of open comb in the center to insure that the bees will cluster there. This honey should be in dark brood combs—not light super combs. The body below should contain 20 to 30 pounds of honey and as much reserve pollen as possible. With the three-story hive, the bottom chamber should contain an additional 20 to 30 pounds of reserve honey. If the stores are not arranged in approximately this manner, the cluster may be held away from their food supply by brood when the queen starts laying early in January.

Because all colonies are not organized ideally, it is good practice to check the colonies by lifting their hive covers some time during midwinter. Where clusters do not occupy the top hive body, the center combs of honey should be exchanged for any combs below that contain brood. Many colonies starve with abundant honey in the hive because of either

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The Wintering Problem

by Dr. William L. Coggshall
Associate Professor of Apiculture
New York State College of Agriculture, Ithaca

SINCE the start of commercial honey production, beekeepers have attempted in various ways to help colonies live through the winter. Nearly everything has been tried, with perhaps too much emphasis being placed on colony aids rather than on the condition of the colonies themselves. In some areas commercial beekeepers have resorted to killing their bees in the fall and replacing them with package bees in the spring.

During the past fifty years various research workers have attempted to study and interpret colony responses to temperature and other environmental factors encountered during winter. From this information it has been hoped that good wintering practices could be developed. Early work indicated that since a cluster of bees is essentially a heat-producing unit, utilizing honey for fuel, insulation in addition to that provided by the insulating zone of live bees would conserve their energy. They should then be capable in the spring of rearing brood and replacing themselves without disturbing normal colony expansion in preparation for the honeyflow. Essentials for successful wintering were said to include a good colony with plenty of young bees, at least forty pounds of high quality honey arranged in a two-story colony so that the cluster could form over nearly empty comb, yet be in constant contact with stored honey. Heavy insulation on top, bottom, and sides was recommended, together with a restricted lower entrance. It was believed that heavy insulation would slow down temperature changes within the hive and permit movement of the cluster to keep it in contact with honey at all times. Wind protection was considered important, since it was found that wind soon nullified the effect of insulation.

More recent research on the behavior of bees during winter has resulted in a somewhat different interpretation. Instead of attempting to conserve bee energy it has been suggested that bee energy should be utilized for replacement of worn out bees. This involves brood rearing in winter and requires strong colonies in late fall provisioned with extra large stores of food including pollen to accomplish this. No extra insulation is considered necessary, but a sunny location with wind protection and air drainage is stressed. An upper entrance, plus a restricted lower entrance, is intended to provide opportunity for flights at favorable times.

These more recent recommendations nearly eliminate cellar wintering from consideration by the beekeeper, since brood rearing in cellars is usually disastrous. To practice cellar wintering it is necessary to proceed under the older theory of conservation of energy. This means that for best results, a cellar should maintain the proper relationship between temperature and humidity to keep the bees quiet. Bees that are uneasy from disturbances such as jarring or light, as well as from accumulating fecal material, tend to raise the cluster temperature high

enough for brood rearing. Once started, brood rearing is continued until the colony is removed for a flight or dies from dysentery. Rearing brood involves the consumption of considerable pollen with the resultant need for frequent flights. Poor quality honey brings about dysentery more quickly than that nearly free from indigestible material. High humidity prevents bees from getting rid of excess moisture in their bodies except through the alimentary tract. This alone can cause a dysentery-like condition, and accentuates ordinary fecal accumulation.

Beekeepers most successful in cellar wintering usually feed sugar sirup heavily in the fall, and do everything else possible to keep the bees quiet. Upon removal from the cellar in late March or early April the colonies are stimulated by feeding sirup, and more recently, by pollen substitutes or supplements. Thus the relatively small colonies can be built up into large ones for the honeyflow. Further research, using modern equipment to control both temperature and humidity, might demonstrate a practical use of artificial cellars for economical wintering of colony units which would be capable of reaching maximum strength at the proper time.

Following considerable use of heavy insulation for a number of years there has been a gradual reduction in this practice, partly due to the introduction of the tar paper wrap. Not only was tar paper a relatively inexpensive material, but it was adapted to modern management which often demands frequent relocation of apiaries. Tar paper nearly eliminated the use of bottom insulation and reduced the amount on top and sides. It also suggested another factor which could favorably affect wintering. This is the property of effective heat ray absorption by a rough dark surface, tending to raise the temperature more quickly on sunny days of the space around the cluster and stimulate bees to flights which might otherwise be missed. The cluster is also enabled to shift its position to keep in contact with stored honey. This absorption of heat greatly assists in the removal of any moisture which has condensed in the insulation during cold, cloudy weather, thus contributing directly to keeping the colony dry. Moisture vapor escaping through the hive walls tends to move through ordinary tar paper. Tar papers heavily impregnated with asphalt serve as moisture vapor barriers and are unsatisfactory for wrapping colonies. While straw is often used between hives and paper, many beekeepers simply wrap the hives with a layer of dull black tar paper.

Factors To Be Considered In Determining Wintering Practices

1. Colony condition. Complete cycles of brood late in the season are needed to provide young, vigorous bees capable of doing the work of perpetuating the colony. Therefore the queen must be a good one, preferably young, and capable of sustained, intensive egg production whenever necessary. Only good colonies can be expected to winter well consistently year after year. Few beekeepers requeen frequently enough to ensure having a high percentage of their colonies in proper condition.

2. Food supplies. Plenty of food should be present in the fall or provided in early spring to ensure rapid expansion and continuity of brood rearing following the end of the winter period. Honeys high in indigestible material may cause considerable dysentery unless flights occur at least monthly.

3. Apiary site. Protection from wind, exposure to sunlight, and good air drainage combined with a site located on well drained or dry soil, are desirable. Such locations are often difficult to find.

4. Entrance and insulation. Some type of upper entrance is necessary if colonies are to remain completely uninsulated; a restricted lower entrance is best whether or not insulation is used. Upper entrances are not so important with tar paper and straw wraps since heat ray absorption helps keep the colony dry. Beekeepers often break the propolis seal or leave an opening in the inner cover before wrapping the hives. "Vapor barrier" types of tar paper should never be used, since moisture will then condense and keep insulation wet. Metal covers placed over tar paper packs often prevent drying out of the insulation beneath them. Insulation appears to assist rapid colony build-up in the spring by helping maintain higher temperatures outside the cluster and permitting the coverage of a greater area of brood.

5. Location and season. No two years are exactly alike. What seems to work satisfactorily in one area may not be a good practice in another. Long periods of confinement to the hive due to cold cloudy weather in a locality often result in severe losses from dysentery. Encouragement of winter brood rearing in these areas does not seem desirable. Timing colony build-up to ensure storing the maximum crop of surplus honey may not everywhere require the wintering of extra large colonies obtained through three-story wintering management. In areas having cool, cloudy weather in late spring, extra large colonies have no opportunity to store surplus from minor spring sources, and frequently become expensive consumers. In areas having a very short intense honeyflow, maintenance of such large colonies for the balance of the season requires a high percentage of the stored crop.

6. Humidity. The ability of bees to regulate the amount of water present in their bodies is a very important consideration in wintering. Carbohydrate metabolism produces water, and this water added to that already present in honey combine to total about a gallon for each gallon of honey consumed. Bees must rid themselves of the excess. If hive humidity due to low temperature is too high, not only must the bees retain most of this in the alimentary tract, but condensation in the hive or insulation will also occur. Condensation in the hive results in excessive growth of molds on accumulating dead bees and debris on the bottom board. This material remains wet for long periods of time, and half or more of the combs in the lower brood nest may become moldy so that the bees chew them badly the next season, replacing them with drone comb. If humidity due to apiary location, or to the effect of insulation plus tar paper, is kept at a favorable percentage, the bees can dispose of the excess water through their breathing system as moisture vapor instead of as a liquid through the alimentary canal, with no resultant discomfort. Too low humidity is rarely experienced except in too dry a cellar, but this can also cause uneasiness. Adjusting metabolic water upward is possible for bees if water is available, but they cannot adjust it downward satisfactorily if humidity is high.

7. Labor. For a number of years beekeepers have gradually reduced the amount of time spent in colony management. They have been depending upon a few simple operations to help prevent swarming, piled on supers, and trusted to luck.

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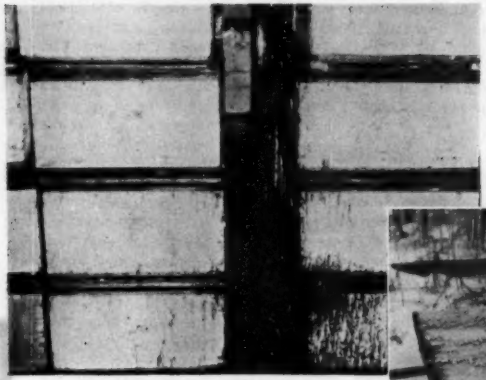


Left: Relative humidity of over 90 per cent in a cellar was mainly responsible for the death of these colonies.

Below: A sudden temperature drop stopped flight so suddenly that many bees, unable to reach their entrances, crawled together into small clusters and died. This is a condition rarely observed.

Center left: East (sunny) side of a tar paper pack holding ten colonies. Very few dead bees near the entrances.

Center right: West (shady) side of the same pack and at the same time. Ground covered with dead bees.

Above left: Large winter cases like these are seldom seen in many states. This apiary has good wind protection on north and west, with a gentle slope to the southeast. Good air drainage, dry soil, and a sunny exposure make this location nearly ideal.

Right: Stages in applying dry wheat-straw and tar paper wraps to commercial apiary. Tough dull-black paper helps keep colonies dry. Hive stands are designed to keep hives off ground and prevent wind from blowing under them when two colonies are pushed close together for winter.

The number of colonies per operator has increased, but with the employment of fewer helpers since trained men are scarce and an important item of cost.

Conclusions

Winter losses have not declined in recent years and probably will not do so in the future unless beekeepers pay more attention to factors which influence wintering. Beekeepers fail most often to replace poor queens, and each fall have far too many poor colonies. Next, too many do not provide sufficient food, and colonies die from starvation. Others neglect factors which appear unimportant to a casual observer, but which can and do cause serious losses. Good colonies can be successfully wintered nearly every year if these few important details are not overlooked.

Secure More Honey This Way

by Avis Stephenson

Webster City, Iowa

HOW many beekeepers stop to think that queen bees are more abundant in the fall since this season follows the long sunny, busy, workaday world of their colonies?

Since queens are more abundant in the fall, and can be secured at a reduced price, it might be more advantageous to beekeepers to requeen in the early fall. Generally there is a light flow of fall honey at this time, which enables the beekeeper to get the queen introduced successfully.

It is well known that a new queen may be given any time the colony needs one, or has lost its queen for any reason.

If this fall method is used, it is generally a good idea to requeen sometime between August 1 and November 1. The chief reason for requeening early in the fall is that the new queen will lay enough eggs to secure or make a nice cluster of young bees to go into the winter. Young bees have a greater length of life, and will enable the colony to winter better.

However, beekeepers must not wait until late chilly fall weather before introducing new queens in the mistaken belief that cool weather causes loose clusters of bees about the old queen and that she can be removed easily and the new young queen placed on the combs where she was. This is entirely too late in the season. Usually the back of the mailing card of the queen cage will give adequate directions for successful queen introduction.

Check each colony's food supply no later than the last of October or the first of November. Be sure that each hive weighs at least 60 pounds with honey included or possibly more. Otherwise it may be necessary to feed lightweight colonies a sirup made up of two parts sugar and one of water. It is usually best to get the feeding done in the late fall, rather than disturb the

Never allow late fall tall weeds to clog hive entrances. Keep grass and weeds in bee yards mowed short to make entry easier and less work for bees. Clean bee yards also make the work of requeening easier for the beekeeper.

bees during the winter months. However, you should not hesitate to supply them sirup if you find them without food during the winter.

With my colonies, I use small five-pound honey cans filled with sirup and inverted upside down inside an empty hive body placed directly above the brood chamber. The sirup seeps out through small holes previously punched in the lids. I rarely find this feeding necessary, since I make a practice of leaving a full depth hive body well filled with honey on each hive in the fall for an extra food chamber for the bees. I seldom lose a colony during the winter when they are thus supplied. Well winter-fed bees provide strong colonies which start to produce young bees early in the spring and get an early start on the honeyflow and pollen gathering.

Often, after the bees have eaten this extra store of honey, I fill the empty chamber with drawn combs and leave it on the hive, if possible, as it serves as an additional space for rearing brood. Thus the colony quickly builds up to a strong army of honey producing workers in a shorter period of preparation. Strong colonies mean more honey.

Always try to winter the bees in a dry location protected from strong winds if possible.

These suggestions, if followed, will aid the beekeeper to secure more honey.

The Importance of Shelter Belts

by E. A. Hogarth

Tara, Ontario, Canada

WHEN the white honeyflow is over and the extracting is well along, we begin to think of the coming winter. Now is the time to make plans for moving those exposed apiaries that failed to winter well last season because of lack of protection from the elements. Probably nothing will pay bigger dividends than moving these colonies into well protected locations that will shelter them from the prevailing winds and provide a ready source of early spring nectar, pollen, and water for a rapid build-up.

In many districts it is almost useless to try to winter bees without a suitable windbreak of some kind. While they may come through the winter reasonably well, they will certainly fail to build up as they should. How often have you seen bees heavily laden with pollen, so chilled by the cold wind that they are unable to reach their hive? When this happens the colonies dwindle rapidly.

I remember one location we had several years ago. The apiary was well protected by a high knoll covered with hard maples. Unfortunately, the bees had to fly several rods across an open field to obtain pollen and nectar in the early spring. There was a heavy loss of flying bees on bright, cool, windy days. Consequently, dwindling was a serious problem. After we moved this yard into the edge of the swamp we had no further trouble with dwindling and the colonies built up rapidly.

Various Types of Shelter

1. **Woods and Swamps.** The best shelter is provided by second growth timber or a swamp that is not too dense nor the trees too tall. If we can find a dry knoll, free from flooding and with sufficient air drainage, with trees or shrubbery on the north, west and east and open to the south, we are in luck. Colonies in this kind of shelter are usually much quieter to handle and are not close enough to tilled land for cross bees to annoy the landlord.

2. **The Contour of the Land.** Often we make use of the contour of the land. If bush sites are not available, this type of shelter is sometimes very effective. The colonies should be placed on the southern or eastern slope. Some trees or shrubbery or even a rail fence along the crest of the hill or some distance above the apiary helps to break the force of the wind and stop it from swirling down over the colonies and burying them with snow.

3. **Man-made Shelters.** As a last resort, fences, hedges, or buildings may be used to break the force of the wind. While these are better than leaving the bees exposed to the full fury of the elements, they are lacking in many desirable features.

Requirements of a Well Sheltered Location

1. **Accessibility.** It should be within reasonable distance of the highway. It must be readily accessible

at all times when it is necessary to work with the bees. In the spring we find it pays to spend a few hours fixing and graveling the roadways, as it saves much time and many vexatious delays later in the season.

2. **Shelter from the Prevailing Winds.** The apiary should be sheltered from the prevailing north and west winds. Low growing shrubbery or woods is much to be preferred to an opening surrounded on all sides by tall trees. If they are hemmed in on all sides by tall trees the colonies will warm up quickly on sunny days early in the spring. When the bees fly out above the trees they become chilled by the cold wind so that they never return. Soon all we have left in the hives is a small cluster of bees and a large quantity of stores. In the summer the wind will whistle through under the trees and rise over the yard as if going through a funnel.

3. **Exposure to the Sunlight.** The hives should be placed so they are exposed to the sunlight at all times during the winter. We have often observed that colonies in the sunlight are always much drier than those that are in the shade for part of the day. Colonies that are in the shade sometimes fail to get a cleansing flight as early in the season as those in the sun.

4. **Freedom from Piled Up Snow.** In districts where the snowfall is heavy, the apiary shouldn't be placed too close to the edge of the woods or near the brow of a hill. The snow may pile up in such huge, hard drifts over the colonies that it smothers them. This is a weak point in fences and hedges as it is almost impossible to avoid drifts in the yard.

5. **Source of Nectar and Pollen in Early Spring.** This is no doubt just as important as shelter from the prevailing winds. I know of no better or more economical method of providing the bees with pollen than having them in or close to a swamp. Willows, poplars, elms, red maples and other shrubs provide an abundant supply of pollen at a critical period in the life of the colony. When situated near a swamp, water is also readily available. While many of our apiaries are in hardwood bush the swamp is only a short distance away. We like to locate in woods that run east and west for half a mile or more rather than in a small bush. When the apiary is situated on the south side of a long shelter belt the bees can work along the warm southern side or slope in the spring, sheltered by the shrubbery or hill from the cool north wind, on days that are too cold for them to work the north side.

6. **Placing the Yard in Relation to Shelter and Drifting.** This is not always as easy as it appears. Even when the apiary is placed where conditions seem to be ideal, we sometimes find, as time goes on, that the wind is in the habit of making a freakish swirl over the yard. In this situation all that is necessary is to move the apiary just enough to miss the air current.

Occasionally, drifting occurs at certain locations and we may find it necessary to rearrange the colonies to overcome it. It usually occurs more frequently when the colonies all face the same direction. To overcome this, they should be placed so that some of the colonies face south, and others east and west.

Wintering Bees

by Ralph W. Barnes
Oakland, Nebraska

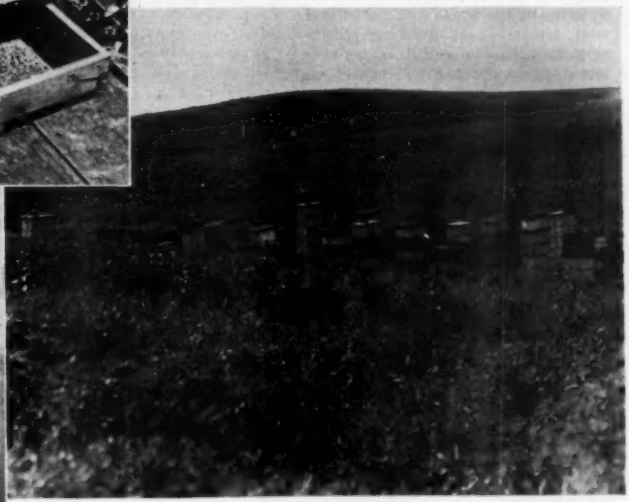
IT IS with some misgiving that I undertake writing an article on wintering bees. However, I shall presume upon my many years as an active beekeeper and hope that some of my experiences may prove helpful to others who are following beekeeping as a profession.

I started beekeeping at Boulder, Colorado, in 1919, having been discharged from the army in 1918. My introduction to beekeeping was with the Foster Honey Company as a bookkeeper. I soon became infected with bee fever and in no time at all owned my first fifty colonies. I thought I had wintering problems, so carefully wrapped the bees in straw and paper, making them quite snug for the Colorado winter. Winters in Colorado do get cold at the mile-high elevation, but the air is dry and the days sunny. How did the bees winter? They didn't. On warm, sunny days they got too warm and clustered out front. At sundown the temperature dropped very quickly and the bees would be chilled before they could get back in. After this sad experience, packing in that locality was given up.

At that time beekeepers were changing from comb honey to ex-

Left: Pollen collected from colonies that are not at full strength give large amounts of spring feed.

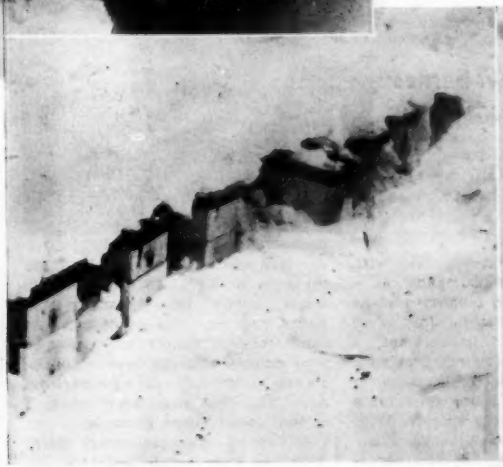
Below: This is the location mentioned in the article that always wintered well. In the picture you are looking toward the northwest, from which the prevailing winds come. Only a small section of the snowfence is visible as weeds cover it. This seems to show that it is what is in the beehive rather than outside conditions that make it possible for bees to survive a severe winter.



Left: February 28. This colony was dug out of a big drift in order to get this picture. Good populations are maintained even under most severe conditions if the colony had the right conditions in the fall.

Left below: Bees dug out of a drift in April. Note large area around each hive has been melted away. Bees were crawling around on the entrance board but it was so cold outside that they were chilled when they tried to fly. They were dug out just to get the picture.

Right: This yard was under fifteen feet of snow. There were alternate layers of snow and ice. The bees were all right when we got to them. It was a problem to dispose of the snow we shoveled out of the trench we dug.



tracted honey, and the common practice was single story colonies for winter. In a few years we migrated to western Nebraska, bees and all. Winter conditions there were much like in Colorado, except that the extremes in temperature were greater, and a strong northwest wind prevailed most of the time. In that locality we experienced temperatures as low as forty below zero. However, bees would get frequent winter flights. It was there that we learned that two full-depth brood chambers were necessary for wintering bees and that it took, for a minimum, sixty pounds of good honey. However, I soon learned that just getting the bees through the winter was only part of wintering. There was no honey-flow in that locality from October 1 to July 1, and to have colonies in top shape by July 1 was a real problem.

During that time I had the good fortune to meet Dr. C. L. Farrar, who was then stationed at Laramie, Wyoming. From him I learned the value of pollen and the large amount needed to carry the colonies through long periods when there was no natural source of pollen. At this time I was operating about one thousand colonies of bees and making a serious study of all phases of beekeeping. Among the many things I learned from Dr. Farrar was the value of reversing the brood chambers. This manipulation enabled me to have both brood chambers full of honey and pollen for winter. Another valuable idea was the placing of three-quarter inch holes in every brood chamber, two inches above the bottom edge of the brood chamber. These flight holes are useful to the colony in a number of ways, but are most valuable in wintering. (Note: ⅜" hail screen is placed over the holes to prevent rodent damage).

After moving to eastern Nebraska, I found wintering bees much more difficult. The relative humidity was much greater than either in Colorado or western Nebraska and temperatures averaged much lower, although the temperature extremes were not so great. Bees would be confined over long periods without a cleansing flight. The only serious losses I have had in wintering bees have been here in eastern Nebraska. This has been due to the long periods when bees could not get cleansing flights. One year in particular the bees had no cleansing flight from October 1 to May 3. Dysentery was very severe and loss was the heaviest in my many years' experience.

I would like to emphasize the fact that snow covering is not harmful to colonies. I have had apiaries buried under snow drifts composed of alternate layers of snow and ice, fourteen feet deep, and they suffered no harm.

Careful observation and examination of colony conditions in many parts of the country and through many seasons, have proved to me that it is almost impossible to kill a colony of bees in what is an average winter, in almost any part of the United States, if the following requirements are met:

Big, strong clusters that have raised ample young bees in the late fall. This requirement is met when there is a late fall flow that gives honey and pollen, not only to raise young bees, but to supply full frames of honey and pollen for winter. If this fall flow is missing, it must be created artificially by feeding liquid honey or sugar. (Use sugar only as a last resort). The colony will require a minimum of sixty pounds of a good honey that will not cause dysentery. Some localities will require greater amounts of honey. Pollen stores are harder to control but a minimum of ten to twelve pounds of pollen should be present in the colony. Your insurance against pollen shortage is to trap ample supplies the preceding summer, which can be fed in the spring to take care of colony needs. (Formulas are available for making pollen cakes, extended with soy flour). Do not be fooled into believing that there are substitutes for natural pollen. **There are none known at this time.** Where no natural pollen is present, the bees have to **draw from body reserves,** and when a colony is forced to do this the adult bees soon become poor and their "ribs show." When this happens brood production drops rapidly and colonies dwindle.

I have also wintered bees at elevations over 8000 feet, and at sea level. Colonies have responded in the same manner at each place. When the needs of the colony have been met, as outlined above, then the climatic conditions can be considered.

In general a good windbreak against prevailing winds should be provided. The apiary should be located where it has good air drainage, if possible, as free flowing air currents are desirable in winter, as well as in summer, in removing stale, damp air. Avoid placing the apiary in heavily shaded groves. One of the best locations we have is located in the hill country where there are no trees at all, a lattice snowfence being the only protection they have. This yard has always wintered splendidly.

Some additional winter helps are facing the colony entrance south and wrapping the colonies in black building paper, using the top flight hole. The black paper seems to absorb heat from the sun's rays. Packing has never paid in any place where I have kept bees. Of course there are other problems in beekeeping, such as disease and queens, but to get the colony through the winter let me assure you the fundamental conditions as outlined cannot be ignored or bypassed.

May all your winters be mild—but don't gamble on it—and may all your honey crops be huge.

Caucasians in Town . . .

Caucasians are said to be the world's gentlest honey bees. By using them in my home yard for the past five years they have me believing this. Our entire home plot measures 100 x 130 feet and is surrounded by both highways and dwellings. No one seems to get stung except me. I am always meddling without gloves and smoke. I seldom use anything but a veil under normal conditions but I do get stung occasionally.

Besides their extra gentleness they are equal to other races in production. They winter well and the queens are prolific. Caucasians are always on their toes and quick on the wing. They guard hives well and do not drift badly. They are noted propolizers and build bridges with burr combs but by using good equipment, with the proper bee space, this can be held to a minimum.

There is lack of proof that Caucasians have longer tongues than any other bees and will work red clover. I have seen them visiting red clover during a dearth, however, I don't know if nectar was collected.

Most of my home yard is run for queen rearing. A few hundred are produced each season for the open market. It seems that there is not enough Caucasian stock bred to satisfy the demand. Perhaps more of them would be used if more were available.

C. B. Eppling,
Virginia

Cellar versus Outside Wintering in the North

by E. Braun

Sr. Apiculturist
Central Experimental Farm
Ottawa, Canada

SUCCESSFUL wintering of honeybee colonies, whether in the cellar or out-of-doors, is in the main, a problem of management. A review on the basis of fall, winter and spring management may assist the reader to grasp the basic principles which lead to successful overwintering.

The following is a brief resume of the wintering experiments conducted over a period of thirty years at the Dominion Experimental Stations at Morden and Brandon, Manitoba. The theories involved or expressed are not necessarily original with the author but are the result of an extensive study of the literature on wintering honey bees and the experimentation personally conducted.

Fall Management

This involves prior planning for the wintering program. Two-year-old or failing queens should be replaced toward the end of the honeyflow and the double brood chambers should be reduced to a single brood chamber at the same time. The single brood chamber should contain two frames of pollen, one or two frames of honey, and at least six empty drawn, dark, brood combs for fall egg laying. A super with empty drawn comb should be placed above the brood chamber, preferably above a queen excluder. Ten fully sealed combs of honey, carefully selected, in a feed super should be placed directly above the super containing the drawn comb. Such an arrangement, towards the end of the honeyflow, provides ample egg laying space for the queen and permits the production of the quantity of young bees required. The empty super provides storage space for the late flow of nectar without crowding the brood nest.

The surplus honey, above the feed super, can be removed as desired for extracting purposes. A final check should be made in late August or early September, when the surplus honey has been removed, to ascertain that brood rearing is proceeding normally, and that the colony will be in fit condition for wintering. The queen excluder and partially filled second super should be removed at this time, and the feed super placed on top of the lower brood chamber. A system such as the one outlined is simple in design and execution, labor saving, and fulfills all the colony requirements regardless of the type of winter management to be practiced.

Winter Management

Cellar Wintering: Certain basic features must be incorporated into the structure of any cellar to be used for overwintering colonies. The size of the unit should provide from 15 to 20 cubic feet of air space per colony with fresh- and foul-air ventilators (8" x 8" or larger) installed to provide adequate cross ventilation with no dead-air pockets, and with the cellar temperature maintained at approximately 40° F. The atmospheric humidity must be kept above 45 per cent, and this can be done by the simple expedient of scattering snow or water over the cellar floor. In a relatively dry bee cellar, metal hive covers tend to conserve the moisture within the hive which provides more populous colonies in the spring than bag- or screen-top ventilated colonies. Furthermore, metal covers separate the rows of hives and prevent overheating which occurs when tiers of colonies adjoin each other. A two-inch space is required between every second tier of hives when bags or solid inner covers are used. Laboratory tests have been conducted to ascertain the effect of atmospheric pressure on the carbon dioxide output, temperature and humidity requirements of colonies or groups of bees, but since these factors are probably interdependent, the information available is difficult to correlate. No adequate study has been made, to my knowledge, on the wintering of honey bees in a specially constructed bee cellar in which the temperature, humidity and airflow were operated under instrumentally controlled conditions to ascertain the optimum standard required.

Outside Wintering: Proper fall preparation of the colony being assumed, the question of outside wintering hinges largely around the type and quantity of packing required, the location and size of the entrance, wind protection and snow coverage. Allow me to state at the outset, that we have overwintered colonies in double brood chambers, in pairs, without any packing material around the hive bodies and with a top entrance (⅜" x ¾" in size) in the province of Manitoba for a number of years. The high mortality rate and condition of the living colonies in the spring, however, do not compare favorably with similar groups of colonies provided with a double layer of building paper; a ¾-inch thickness of tentest; an 8-inch layer of planer shavings; or 2 inches of balsam wool or fiber glass bats covered with tar or fibreen paper. Over a ten-year period the mortality rate decreased and spring strength increased in ascending order for the varied types of insulating materials tested with top entrances (2"x⅜"). The average

spring strength or mortality did not vary appreciably between groups of insulating material (balsam wool).

The apiary site was on a side hill with ample air drainage and well protected on all sides by a good windbreak of evergreen and deciduous trees and shrubs. Wind protection and snow coverage are vital factors to be considered in any outdoor wintering plan.

The following points should be considered when making a decision as to the type of wintering method to be employed:

1. Proper colony preparations in late summer are of greater importance for successful wintering than whether the colonies are wintered in a bee cellar or out-of-doors.

2. Colonies, having thirty frames covered with bees in the fall, used approximately the same amount of stores, had the same spring strength whether wintered inside or outside, and used an average of five pounds less stores than colonies covering fifty-five or more frames in the fall. The stronger colonies covered an average of three more frames with bees in the spring and their honey production was twice the amount obtained from the weaker colonies in the fall.

3. Outside-wintered colonies had an average loss in weight of 39 pounds and had nine frames covered by bees in the spring as compared to 43 pounds for the cellar-wintered colonies with an average of seven and one-half frames covered by bees.

4. Neither colony spring strength nor subsequent honey production was affected by loss of weight of stores during the wintering period.

5. Overwintered colonies covering less than six frames with bees in the spring produced approximately the same amount of honey as two-pound packages (126 pounds), as compared to 193 pounds from overwintered colonies covering six or more frames in the spring.

6. Outside-wintered colonies, in double brood chambers, may be packed in late September or early October and require no further attention until late April or early May. Limited and general cleansing flights may occur late in the fall, during the winter months or early spring. Brood rearing can and does frequently begin in late January or early February and thus young bees are present in greater numbers for the spring build-up.

7. Cellar-wintered colonies are generally left unprotected until the first snowfall to permit last minute cleansing flights before storing in the cellar. Brood rearing during the early spring excites the colonies, raises the cellar temperature and generally results in too early removal of the colonies from the cellar for cleansing flights. The age of the bees, confined in the cellar with a limited replacement, results in spring dwindling which frequently affects colony build-up in the spring and honey production during the summer.

In conclusion one surviving colony properly packed or stored is of more potential value as a honey producer than three or four mediocre colonies in the spring. Quality and not necessarily the numbers of colonies, in the spring, will determine whether the amount of labor and expenses involved was justified.

Wintering Bees in a Repository Above Ground

by Paul L. Holcombe

Lambertville, New Jersey

THE problem of wintering bees successfully has been discussed in bee books and various bee magazines in all lands where bees are kept. In his book, "Mysteries of Bee Keeping Explained" (1864), Moses Quinby writes on wintering bees: "There is as much diversity of opinion with respect to wintering bees as there is to the construction of hives, and about as difficult to reconcile as moisture and mold."

In the fall of 1936, Mr. H. N. Conner, Stockton, New Jersey, a queen breeder of Caucasian and Italian queens, ended the season with approximately fifty queenright nuclei. The little colonies consisted of two and three standard frames headed by vigorous young queens which would have a potential value in the following spring's bee work, provided they could be successfully wintered. The nuclei had been fed a liberal amount of sugar sirup throughout the queen-mating season, thus the colonies were supplied with good winter food.

Near the queen-rearing yard there was an unused chicken house, twenty by twenty-four feet, with a sloping roof fourteen feet high. The floor was made of concrete about one foot above the ground level. A board partition was placed through the center with a door between the

two rooms. The windows were boarded up. The ceiling and side walls of one room were lined with four inches of rock wool. In the other room a coal stove was set up to supply necessary heat when needed. One hundred and fifty to two hundred small colonies have been wintered in the insulated room each year since the first successful experiment in 1936.

During the years, because of varying weather, no definite date as to when to place the colonies in the insulated room could be determined. It was found that the opportune time to move the colonies inside is when the outside temperature goes down to 20 degrees Fahrenheit, which usually occurs the last of November or the first of December. A fire is started in the coal stove bringing the temperature of the two rooms up to around 45 or 50 degrees. The colonies are brought into the warm room. The bees are shaken or brushed from the combs down onto the bottom board to permit a complete check for winter stores. Empty combs are replaced with filled combs, care being taken that the colony has room to cluster on dry comb with ample food supply above. The bees are in a chilled state when shaken from the combs, however, they soon crawl up on the provided combs and remain quiet.

After examination, the colonies are carried into the insulated repository and piled one above the other in rows. Previous to storing the colonies, a platform is arranged about a foot up from the concrete floor to accommodate the colonies and allow circulation of air. During the winter months, when the outside temperature goes down, the room temperature is checked frequently and never allowed to go below 40 degrees. When needed, the coal fire is started in the adjoining room, the door opened to permit the warm air to enter and bring up the temperature. The door is closed as soon as it reaches 50 degrees.

The colonies are removed from the repository about the middle of March, depending upon the weather. It is an advantage to the colonies if there is natural pollen available to stimulate brood rearing.

There are a number of advantages to this type of wintering. With the high humidity, it is impossible to winter colonies in cellars or other underground rooms in New Jersey. Moisture accumulates very rapidly within the hive, making it very uncomfortable for the bees, resulting in heavy winter losses. The repository above ground remains very dry; this automatically eliminates the possible chance of moldy combs. The tested queens are available in early spring to replace those lost during the winter from various causes. Queens are also available in spring for early shipment of package bees.

These are established nuclei with brood in all stages of development, each ready to receive a ripe queen cell when the laying queen is removed. This is a quick means of increasing the number of colonies sometimes needed in the early part of the season.

Cellar Wintering

by Charles S. Hofmann

Janesville, Minnesota

TO provide cellar quarters for bees relieves them from the job of "battling the elephants" outside; they respond by consuming less winter stores; and all kinds of colonies—pint size or powerful—winter on equal terms.

To winter bees successfully indoors requires that one must understand and adhere carefully to the basic principles involved. Over a long period of wintering bees in a great many types, sizes, and shapes of cellars—some of them temporary makeshifts constructed under buildings never intended for the purpose—experience has proved this, and it has also proved that construction cost is fortunately not the guiding factor and that the most crude or most elaborate cellar can succeed or fail.

Assuming that we have good colonies to put into the cellar, these bees in order to winter properly must have five things: (1) building protection, (2) air, (3) proper temperature, (4) darkness, (5) proper humidity and moisture control.

In an extremely flat territory, cellar construction may present a problem from the drainage angle but this would be rare as actually a great amount of slope is not needed. A cellar must be far enough underground so that an even temperature can be maintained which would place the ceiling at least slightly below the ground level. In other

An outyard cellar built on a gentle slope. Notice the small vestibule allowing double doors which are necessary for warmth and to keep out light. This cellar entrance is level with the ground.

words, the cellar proper would be entirely underground. If need be the dirt from the excavation can be supplemented with "borrowed" dirt to accomplish this.

The roof and that portion of the wall above ground must, of course, shed water. Galvanized iron over a skeleton of two-by-fours is ideal. The cellar wall may be any type that will support the roof and hold back the dirt. The floor may be any material or just plain dirt. In our experience the cheapest and by far the best ceiling is woven wire over some kind of a supporting framework and on which is placed about 12" to 15" of (well settled) straw.

Air in a cellar serves a two-fold purpose—it controls the temperature and supplies oxygen to the bees. Bees need air, and since they breathe all the time, the air supply must be constant. Also it must be in sufficient supply so that the bees are not forced to use it down to the last molecule of oxygen. Insufficient air has a tendency to force the bees to the entrance, make them nervous, and incite them to activity in an effort to "fan their faces." This activity creates the need for more air and trouble multiplies.

Air taken in through short ducts and removed through cupolas or other similar means has never worked well for us. This system requires considerable attention, results in rather an off again, on again air supply, and causes too much fluctuation in temperature in spite of the beekeeper's efforts to avoid it. Many years ago we began using underground tile lines for air intakes and they worked so well we have used them ever since. These are ordinary drain tile laid on grade so that they can double for drainage in case of seepage or other need. The advantages of this method are that air coming into a cellar through 80 to 100 feet or more of tile does not cause a draft and is tempered somewhat by the ground and will therefore not affect the cellar temperature as quickly. In the spring when the temperature outside may rise suddenly for a day or two, the cool ground will help keep the cellar temperature down. The tile should run under the floor with the opening at the back of the cellar as this will increase the "tempering" of the air.

The air can best be taken out of the cellar through an opening in the straw ceiling furnished by a box about 3' to 4' square without top or bottom and resting on the woven wire. This ventilator should be about three-fourths of the length of the cellar away from the tile inlet to ensure an even distribution of air, and should have some sort of an "umbrella" canopy to keep out light. During cold weather this

Flash picture taken in early March. The temperature can be checked from above by pulling thermometer up through a piece of eaves spout tubing.

outlet can be closed with some sort of quilt or blanket. The air will then come in through the tile only as fast as it can seep up through the straw ceiling. This will provide a gentle change of air even during very cold weather.

Temperature in a cellar need not be constant but I believe a range between 36 degrees and 42 degrees is ideal. If temperature varies from this range it would be better for it to go down than up. Here it could be mentioned that although some importance should be placed on humidity it actually is no problem and if there is proper ventilation little thought need be given this because a constant and gentle movement of air through the cellar acts as a fine humidity balancer, and eliminates stagnation and any subsequent moisture problem.

A cellar should be dark—not almost, but absolutely. This is not so vital the first half of the winter, but as spring approaches it becomes more important. The smallest pin hole looms large and bright in an otherwise dark cellar and even if the light is not enough to cause bees to leave their hive it will cause undesirable disturbance and agitation. Bees in a cellar should be kept as oblivious as possible to any condition outside their hive and poor air, light, and rapid fluctuation in temperature tend to defeat this.

Cellar capacity can be most easily determined in terms of cubic feet, allowing at least 30 cubic feet per colony. Tile size must be governed somewhat by relationship of diameter to total length since the longer the tile line the greater retard to the air flow. Any system of ventilation that depends on gravity will lose efficiency when the temperature differential decreases. In other words when the temperature outside begins to approach that inside the cellar the air moves slower. Therefore tile lines should be large enough to furnish enough air even at a reduced flow. If the diameter in inches is multiplied by seven the result will be the average number of colonies a tile will supply air for. Therefore a 12" tile will supply air for about 84 colonies. Use this same rule to determine the length of the tile line. In other words this same 12" tile should be roughly 84' long. Variations can, of course, be made from this but don't deviate too far.

The capacity of any cellar can be increased by 30% to 50% if some sort of forced ventilation is used during the crucial last two or three weeks of wintering. We have ample cellar room now but some years ago we used a suction fan to draw air out of the cellar which in turn was replaced by an increased flow through the tile. This worked perfectly over a period of several years. I believe, however, the job could be done more cheaply by a small blower fan that could be placed in the tile line itself.

When bees are put into the cellars (usually about Thanksgiving time) they are placed on covers or racks so they are about a foot off the floor. All ventilators are left open so the cold can quiet the bees and help offset the disturbance of carrying. In a week or so, if it is cold, the ceiling ventilator is closed for the winter. Toward spring (probably about March 1) this ventilator is opened again. These two visits are necessary but will usually suffice since only in the most unusual winters will the cellar temperature be apt to get too far out of range.

Problems of Wintering in Scotland

by Robert N. H. Skilling
Kilmarnock, Scotland

I SUPPOSE that the successful wintering of bees is a problem which vexes beekeepers in every country of the world which enjoys, or endures, winter conditions.

In Scotland we seldom experience the extreme temperatures which are common in many parts of the American continent. We have cold, frost and snow, but not for long periods. We have frequent periods when it is mild, wet, and very damp. Damp!—that is the key word in Britain. We find that our bees can stand the most severe frost we are likely to experience, but damp permeates the hive, and is responsible for most winter losses—except perhaps, for those stocks which die of starvation.

Damp and its evil effects on our bees has, more or less, determined the pattern of development of our hives. The W. B. C. hive and its derivatives were produced to overcome dampness. The idea behind all these double-walled hives was to provide an air space between the outer and inner walls, so keeping the hive free from damp, in much the same way as builders, in this country at least, always introduce damp courses into the walls and floors of houses.

At one time, beekeepers tried packing the space between the walls with cork dust or chaff as additional insulation, but this was abandoned after it was found that the packing held the damp, and made matters worse. Another method, tried and discarded, was to swathe each hive in a thick covering of straw, while others had large outer covers made to hold four hives. All these methods seem to have been

Right: A small back garden apiary nearly buried in snow during the winter.

Below: The same back garden apiary in summer.

Right center: A corner of the author's apiary. Note high hedge which provides excellent shelter.

Above: The author's outapiary.

Right: Corner of a prosperous Scottish apiary. Note the two-queen colony.

cast aside as useless. Now we have a school of thought, which is gaining more and more influence and acceptance, which advocates single-walled hives, more or less after American design, with no special wrapping, so long as there is an effective windbreak around the apiary. Most of the advocates of this system also believe that through ventilation, in one form or other, is the answer to dampness. I have found that bees winter very well, even during the most trying winters, in single-walled hives with moderate through ventilation. Nevertheless, one cannot lightly dismiss the double-walled hive. I believe that it does help combat the excessive chill and damp of our winter more effectively than the single-walled type. The question which must be resolved is whether or not this slight advantage is cancelled by the higher cost of the hive, the greater labor involved in handling throughout the active season, and the difficulty of transporting the hives from place to place. There can be no doubt that the single-walled hive scores heavily in portability—and most Scottish beekeepers find it necessary to move their hives from their home stance to the heather hills and moors in the autumn.

Some years ago beekeepers were in the habit of adding layer after layer of quilts to their hives in the winter months. One would find great quantities of nondescript cast-off clothing employed for this purpose—as often as not in varying states of uncleanliness. Many beekeepers still think it necessary to see that their bees are "well happed" for the rigors of winter, but progressive beekeepers content themselves with a simple crown board, or a thin layer of canvas, and the bees do well with this treatment. Usually where thick layers of quilting are used, it will be found that by mid-winter they are thoroughly saturated, and can hardly be of help to the colony beneath.

There is a belief widespread amongst beekeepers in this country and in Europe that heather honey is not suitable for successful wintering. American beekeepers may not be familiar with the properties of this distinctive Scottish product. Heather honey is gathered from the small shrub **Calluna vulgaris**, or ling heather. It is of rich amber color and of a characteristic bitter-sweet flavor. One of the outstanding features of the honey is the fact that it is of a jellylike consistency rather than liquid. An investigation is being carried out at present by the Research Committee of the Scottish Beekeepers' Association to find out whether or not it is a suitable winter food. Many beekeepers report dysentery in stocks which have overwintered on heather honey, but I have observed no such ill effects. I rather blame too much unripe honey in the hive becoming fermented owing to our damp climate.

Given a strong healthy stock of bees, queenright, in a weatherproof hive and with ample stores, well ripened, there is little difficulty in getting bees to winter well in Scotland.

Fall Management in North Central Texas

by O. T. Stroope

Frisco, Texas

IT is hard to know just when fall management begins. I guess it really begins when we are taking honey from the apiary for the last time of the year. The honey should be taken just before broomweed and aster stop blooming, and at least a shallow super of honey, or better still a hive body of honey, should be left for the bees to winter on. As soon as combs have been extracted we put the supers back on the bees for a few days for the bees to dry, then strip all of the empty supers off and store them. This cuts the hive down to a double hive body or a hive body and one super. The remaining flow will cut brood rearing as the brood nest is filled or rimmed with honey. The taking off of supers has other benefits also. High winds and cattle are not as apt to overturn the hives and not as much equipment will be destroyed. Then too, the next spring it is much easier to work the bees when we don't have to handle so much equipment.

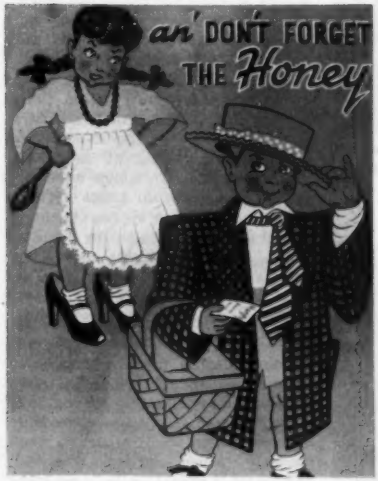
After taking the supers off, the next step is to check each hive to see that it has a good laying queen, plenty of bees and honey, and to be sure that it is free from American foulbrood. The hives that are weak, with a failing queen or queenless, are set up on other hives in the apiary and the honey is given to the lightest colonies.

The next thing we do is to reduce the entrance enough to keep out small mice. To do this, plaster laths are cut to fit the entrance and then a small opening is cut for the bees. At the same time we do this we also put two nails in any cover that is loose to keep the wind from blowing it off. During the fall and winter we drive by each apiary about once a month to see that there are no hives overturned or tops off.

When we are storing the empty equipment we cull out bad combs and supers that need repairing and painting. There are several ways to store combs, but I use a room that is 20' x 30' and has an 11' ceiling. The supers are staggered and are set on two-by-fours. This allows air to circulate under and through the supers. We use a fan to circulate the air and open nine cans of methol bromide into the room which kills all the millers and wax moths that might happen to come in with the supers. Another nine cans should be used in about two weeks.

Easel — 25c each

Poster — 17" x 11" — 3 for 25c



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National Honey Month
— October —
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The easels and posters shown on this page are only a part of the advertising material available from American Honey Institute. A more complete list is given on page 435. On page 369 in the September issue are illustrated more booklets and leaflets. For any of this material or for more information write to American Honey Institute, Madison, Wisconsin.

Shrubs for Fall Nectar

by Melvin A. Pellett

American Bee Journal Test Gardens

Atlantic, Iowa

IN late summer we always notice several of our shrubs which bloom at that time and are most attractive to the bees. These are the kind of honey plants which the bees work almost constantly; the flowers are humming with bees when in bloom and are apparently heavy yielders of nectar. There is a great need over much of the country for honey plants which bloom after the clover flow is past, to lengthen the honeyflow. In many localities it would be a great help if more late blooming plants were present even as minor sources to give stimulus. Honey producing shrubs which also serve other useful purposes may well bring some long time benefits to bee pasture in the localities to which they are suited.

VITEX INCISA NEGUNDO

This Vitex is the variety the bees really do work. In southern Missouri it is reported to furnish up to three months of solid bloom which the bees work as freely as they do sweet clover. It continues to bloom long after sweet clover is past, some seasons until nearly frost. Our Vitex begins blooming in July and usually continues well into the fall —the bees work it constantly. In proportion to the area planted, we think it is one of the best honey plants we know. This should not be confused with some other varieties of Vitex which make nice ornamentals but are reported as of not much use to the bees.

Eleven year old Vitex incisa negundo at Pellett Gardens.

Vitex incisa negundo is attractive in foliage and flower and good for windbreak plantings where it is adapted. It is suitable for use as a semi-ornamental shrub. It is likely best suited to our central southern states—southern Missouri, Oklahoma and parts of Texas. It reaches a height of twelve to fifteen feet or perhaps up to twenty feet. Oklahoma reports it as very hardy and having stood up under comparative drought conditions for a long period. Farther north it may kill back in winter so does not reach full height. It begins blooming at an early age, blooms on the new wood and may have some bloom even the first year from seed. This plant was introduced into this country from China by the Bureau of Plant Industry. It was reported at the time by the explorer who found it as having pretty blue flowers which were diligently visited by all kinds of bees. The Chinese used it for basketry manufacture, taking the annual shoots for that purpose. It has not been extensively planted here except in a few localities. Beekeepers take note of it and a few have set it out in groves.

This Vitex is usually propagated from seed, although the seed is often difficult to germinate. Attempts to start the seed many times result in disappointment. However, when properly ripened seed is used, a good portion of it should grow under right conditions. The seedbed should be kept constantly moist for the germination period which takes from two to four weeks. We found the seed slow to germinate but with constant moisture the seedlings began coming up after two weeks and before long they were quite thick in the row. The young trees will transplant readily in early spring at the age of one or two years as whips ranging in length from one to three feet or more.

Vitex incisa negundo is listed in references as not hardy north of Massachusetts, Pennsylvania, Indi-

ana, Missouri and Kansas and as precariously root hardy on the upper limits of this range. However, we do have a clump in the American Bee Journal Test Gardens which has survived more than a decade here in western Iowa. It usually kills back in winter so the height here is only about eight feet. In spring the dead wood can be pruned off. The new growth quickly grows out as the season advances. It has not failed in its long bloom and attractiveness to the bees in the eleven years since planted. This indicates this plant may have possibilities for climates as severe as ours where the minimum winter temperature is usually ten to twenty-five degrees below zero. There are some strains reported to be hardier than others.

If the use of this shrub can be popularized, apparently it would be of help to late season bee pasture. I see no reason why it will not fit in well along with windbreaks and wildlife shelters; and for beekeepers a screen around the bee yard.

ARALIA

Again we take notice of the Aralia, also referred to as Hercules'-club or Devil's-walking-stick. It has been in bloom for quite some time and has some bloom the first of September. The bees are humming over the flowers in large numbers. The large spikes of small flowers are well above the leaves. These large flower clusters give a rather odd and striking appearance. This is a spindly growing shrub or small tree which suckers some from the base. It is apparently one of the best for bees if some other good use can be found for it. It is a peculiar, odd appearing shrub which would not fit in well for landscaping in most small gardens, but perhaps would serve the purpose where a thicket or variety of shrubs for a screen is desired.

LESPEDEZA BICOLOR and CYRTOBOTRA

These are long-lived, shrubby perennials which are usually free yielders of nectar. They begin blooming here in late August. **Bicolor** and **cyrtobotra** were first planted in the Honey Plant Gardens in 1937. Fifteen years later these same original plants are alive and healthy and coming into heavy bloom the last week in August. In more recent years these varieties, principally **bicolor**, have been rather extensively planted in some southern states to serve a dual purpose in erosion control and to furnish cover and winter feed for wildlife, chiefly quail. Surplus honey is reported where this plant is sufficiently plentiful.

Aralia with large flower clusters heavily worked by bees.

The **lespedezas, bicolor and cyrtobotra** are both desirable for planting where a screen or hedge is desired. We like them for the attractive foliage and numerous rose-lavender colored flowers. For us they grow from six to eight feet tall. We can depend on them for heavy bloom in late summer or early fall. Apparently they are first line honey plants.

Of the shrubby lespedezas we know, we think the variety **cyrtobotra** may be the best honey plant, as we observed a few times that the bees were working it freely when for some reason they had deserted **bicolor**. However, **bicolor** is the one most extensively planted in conservation uses. The comparative ease of propagation lends it to large scale planting. Neither of these varieties will usually mature its seed in the North which limits their use as a source of seed for wildlife to south of Mason and Dixon's line. Also in the North they will often kill to the ground in winter, growing from the crowns the following spring. They are apparently entirely root hardy, at least as far north as central Iowa and central New England.

There are a number of varieties of the shrubby lespedezas. Differing from the lower growing species commonly used as forage crops, indications are that most of the shrubby varieties yield nectar freely. While **bicolor** is being promoted by conservation clubs in the South, some search is being made for an earlier maturing strain to serve the same purpose in the North. We have started this season in the Honey Plant Gardens several strains of **Lespedeza japonica** which are reported to be earlier maturing. Observations here and reports we have received elsewhere indicate that shrubby lespedezas offer good possibilities for bee pasture improvement where they can be used.

The Ohio Capping Wax Melter*

by Dr. W. E. Dunham

Department of Entomology
Ohio Agricultural Experiment Station
Wooster, Ohio

THE demand for domestic beeswax far exceeds the supply and as a result much beeswax is imported. During peace times there are many diversified uses for beeswax, while in war periods there is a critical shortage due to the many demands of war industries. Much domestic beeswax is obtained in rendering wax from combs but a far greater proportion of a better grade wax is derived from wax cappings obtained in the process of extracted honey production. The ratio of capping beeswax to 100 pounds of extracted honey ranges from 1 to 2 pounds, depending on the system of bee management employed by the honey producer.

In the proper handling of the honey cappings there are two main procedures followed by honey producers. These involve, first, salvaging as much honey as possible from the honey cappings, and second, processing the dried cappings for the beeswax.

Removal of honey from the honey cappings is accomplished by various methods which vary in efficiency. The methods utilized are: draining the honey from the cappings in a false screened bottom tank, removing the honey by centrifugal force or pressing the honey from the cappings. These dried cappings may still contain 50 per cent or more of honey.

The last stage, the processing of the dried cappings for beeswax, is accomplished by various methods; namely, 1. salvaging the beeswax but with the total loss of the remaining honey in the cappings; 2. melting the cappings in a heat chamber and allowing the honey and wax to run into a container. The wax, being lighter than honey, seeks the top level and upon cooling can be removed as a cake; 3. heating the cappings by steam coils or by solar heat in a large tank and by improvised methods running the honey and wax into separate containers.

The Ohio Capping Melter has the outstanding advantage of operating as a rapid continuous process entailing the minimum amount of labor and yet salvaging all the honey and assuring the best grade of crude beeswax. In one test involving approximately 2600 pounds of beeswax the quality was such that the total poundage was accepted by a buyer as top grade crude beeswax.

Construction Features

The steam grills used in this capping melter are the same as those used in the Senior size Brand Melter and can be purchased from bee supply companies. Also the arrangement of the honey-well for controlling the honey level was adapted from the Brand Melter.

The line drawings, figures 1 and 2, give a general perspective of the Ohio Capping Melter especially as to the relative positions of its features. The directions given in narrative form should be followed accurately.

Galvanized sheet metal of 18 gauge, galvanized piping and copper grills are the metals employed in constructing this capping melter. Beeswax coming in contact with these metals is slightly discolored, however, the discoloration is negligible. Over a period of several years, the wax rendered through this tank has graded as lemon yellow and has commanded the highest price. Stainless steel, although more expensive, would be the ideal metal to use as it would result in no discoloration to the wax.

The galvanized tank is constructed with inside measurements as follows: 50 inches long, 36¾ inches wide and 35¼ inches high (Fig. 1). The overlapping seams are riveted and soldered to seal them and to give strength to the tank.

The Steam Jacket. A two-inch steam jacket 29 inches wide is constructed on the ends and back of the tank. The jacket is two inches lower than the top of the tank to allow space for the cover to set over the rim (Fig. 1-No. 4). The steam jacket is soldered and riveted securely to the tank. Three bolts are soldered to the jacket on each end and two bolts on the back to give additional support (Fig. 1-No. 5). Figure 1-No. 7 shows the respective positions of the steam outlet pipes which convey steam from the grills into the steam jacket. The steam jacket should not be attached to the tank until all the fixtures of the tank are completed.

The Wax Outlets. The wax outlets are 9¾ inches from the bottom of the tank and spaced 14 inches from the ends of the complete tank (Fig. 1-No. 2). The wax is conveyed to the outside of the tank by two 4-inch galvanized nipples ½ inch in diameter. These are fitted with lock nuts, the inside ones being soldered to the tank to prevent leakage.

The Honey-Well. This is a device used to maintain a certain honey level within the tank. It aids in a more efficient operation of the wax tank and prevents hot beeswax from overflowing into the honey. The construction is simple (Fig. 1-No. 1). The honey-well which is 12¼ inches high, 5¼ inches long and 3 inches wide is located in the front left corner of the tank. This corner serves as one side and end of the well (Fig. 2-No. 7). The back and other end are soldered to the tank to prevent seepage (Fig. 2-No. 6). A slot ¾ inch high by 5¼ inches long is provided in the rear of the well to allow the flow of honey from the bottom

* Journal Article No. 29-52.

of the tank into the honey-well (Fig. 2-No. 1). The top of the overflow pipe within the well is 8½ inches from the bottom of the tank (Fig. 2-No. 2). One and a quarter inch galvanized piping is used with the inside lock nut soldered to the tank to prevent leakage (Fig. 2-No. 5).

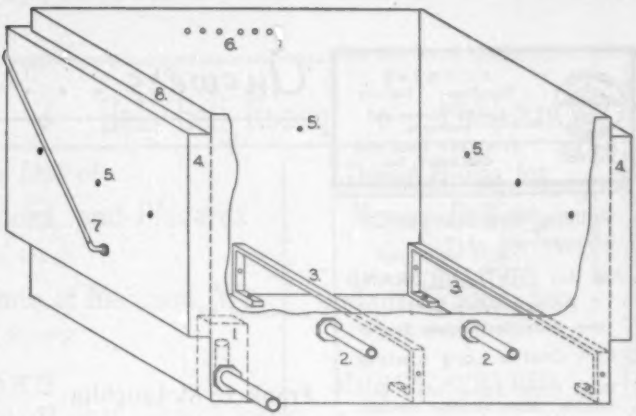
The Supports for the Grills. The top level of the supports are 12¼ inches from the bottom of the tank. The side supports for the grills are made from galvanized iron ¾ inch wide by ¼ inch thick whereas the center support is 1½ inches wide by ¼ inch thick. These are cut and formed and riveted to the tank as shown in figure 1-No. 3. Soldering over the heads of the rivets on the outside of the tank is essential to prevent leakage.

The Shield. The grills are pushed to the front of the tank leaving space in the back to allow necessary room for connecting and disconnecting the pipe fittings. To hold the wax capping on the same level as the grills, a shield of heavy galvanized sheeting which is easily removed is placed over this space.

The Steam Inlets and Outlets. Eight to ten pounds of steam pressure is sufficient for operating the wax tank. By means of a four-way steam valve regulator the steam is conveyed through copper pipes into the tank (Fig. 1-No. 6) and to the grills (Fig. 3-No. 1). Each grill is made of two separate steam compartments. The steam outlets to each grill are united into one pipe. These two outlet pipes carry the steam out of the tank (Fig. 1-No. 6) into the steam jacket on each side of the tank (Fig. 1-No. 7). On the right of the tank, an outlet at the bottom of the steam jacket allows for the escape of steam and water.

The Platform. The wax tank should be set on a platform constructed so that the front of the tank is ¾ inch lower than the back. The height should be such that space is sufficient for easy handling of wax containers and for a supplementary honey receptacle which receives the honey from the wax tank.

The Ohio Capping Melter with two steam grills is adequate to take care of dried cappings from honey crops amounting from 150,000 to 250,000 pounds. A smaller size melter could be made by using one steam grill which would be adequate for honey crops ranging from 50,000 to 100,000 pounds.



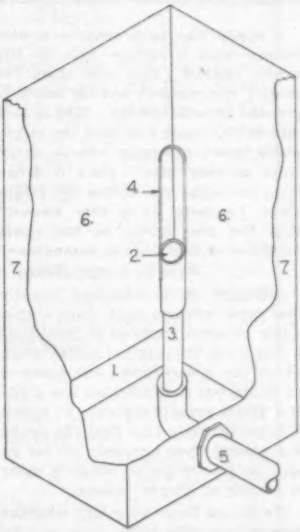


Figure 1. General View of Wax Melting Tank.

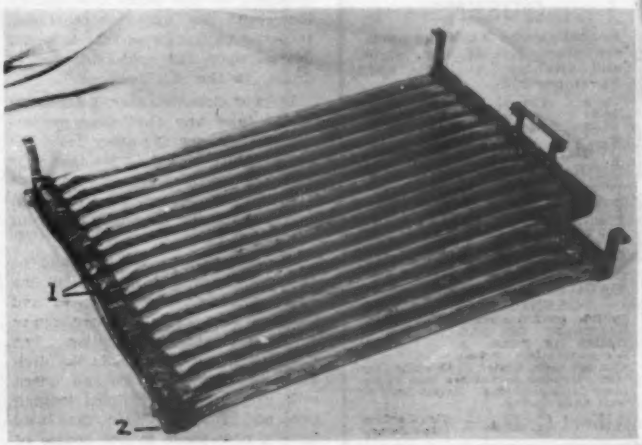
1. Honey-well with pipe for flow of honey.
2. Wax outlets.
3. Grill supports.
4. Steam jacket.
5. Bolts to reinforce steam jacket.
6. Holes for inlet and outlet steam pipes.
7. Steam pipe outlet leading from grill to steam jacket.
8. Two-inch metal rim over which metal cover fits.

Figure 2. Enlarged View of Honey-well.

1. Slot for flow of honey from tank into the honey-well.
2. Over-flow pipe for honey.
3. Removable pipe for draining honey from tank.
4. Heavy wire handle soldered to pipe (3) to facilitate removing it.
5. Pipe from honey-well to auxiliary storage tank.
6. Back and end of honey-well.
7. Front and end of wax tank.

Figure 3. Steam Grill.

1. The two steam inlets.
2. Steam outlet pipe.



Answers . . .

conducted by

Frank E. McLaughlin

I would like to propagate a new colony from a certain hive by the nuclei method. How far must the starter or transport box be taken to prevent cross-breeding? Will a half mile be far enough so that the virgin queen won't mis-mate with a drone from another hive? Does a drone from the same hive follow the virgin queen to mate or is this known? Will the new queen be the exact duplicate of those in the parent hive?

Paul L. Lange, Texas

Although it is assumed usually that most matings take place within a few hundred yards or at least half a mile from the original colony from which the queen comes out, there is no doubt but that matings are made at a much greater distance at times. It is particularly true that the drone is a strong flyer and may go for as high as two miles or possibly more in search of virgin queens.

We do not know very well whether drones from the same hive usually mate with the queen or otherwise. It would be our guess that it would depend upon the preponderance of drones in the neighborhood.

In your circumstances, I doubt we would take any particular precaution to get very far away from the orginial hive except to see that it is at least several feet away so there can be no danger of bees or queen returning to the original hive or of robbing.

Probably your best bet would be to move the nucleus away with the poor queen properly introduced and let the bees raise another queen right on the original location. Ten days after you have made the division, go ahead and kill all queen cells except the very finest looking one, and you should in that way have a new queen in due course of time. Or, if you don't want to waste all of that time, your nucleus method of rearing a queen for your new divide as well as for the old colony is all right. In that case, you will have to provide two nuclei.

Of course, all of this should be done in warm weather after the bees are flying.

I want to sell my honey under the name "Ambrosia Honey." How can I find out if this name can be copyrighted?

W. W. Ward, California

The best thing to do about "Ambrosia Honey" is to write to the Copyright Office, Library of Congress, Washington, D. C. They can give you the information promptly. Probably what you would have to do would be to have some special design such as English lettering or something of that kind in order to have a copyright, although that may not be necessary. At any rate, the name probably could be copyrighted if it has not been used before.

Since I have no place to store extra honey supers could I leave them on the hives before I extract and after they are empty?

Paul A. Doerr, Jr., Pennsylvania

If you mean extracting honey supers and not comb honey supers, then of course, they could be left on the beehive if you wish the year around. In fact, in the South where wax moth is so prevalent, they are pretty generally left on the colonies most of the time. There would be too much travel staining on comb honey supers to leave them on all the time and the sections would be poor for storage of honey.

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All Around The Bee Yard

by G. H. Cale

I have a bone to pick with the "Round-ups." They have shut out much of the general reading the Journal used to have each month. That is a bit tough on our good contributors and perhaps disappointing to many readers. But when the "Round-ups" demand so much space that they shut out "All Around the Bee Yard" that is a different matter. My public is not pleased and my vanity is hurt. Under the circumstances, we must grin and bear it because the "Round-ups" carry considerable weight with readers and the fan mail about them is so heavy it would be politically dangerous to allow personal feelings to interfere with their popularity.

So, accepting the inevitable desire of our readers, we are impelled to give them what they want—next year, an entirely new approach for Journal content. The 1952 "Round-ups" have been largely timed to fit the bee season; next year they will be concerned with those important problems which are not necessarily seasonal like supersedure, diseases, locations, replacement and increase, and so on. We also plan a new name and a more extended general reading, set off by a bright new format.

The beekeeping picture, like all present day interests, changes so rapidly that the individual hardly knows what is going on. Take this October drive on honey sales. Ever see anything like that before? Talk about government "intervention," if all the "intervening" is as weighty and purposeful as the October drive, let's have lots of it. We hope to have a full report of what will be accomplished this month in an early issue, so be set for a report that will show you how the hands of time can, in a short thirty days, kick a whole industry upstairs in one swoop. Enough to say now that the Production and Marketing Administration, through G. Chester Freeman and his field men, have put honey on the food map in a big way and it's up to us to see that it stays there.

Most encouraging result of the new support plan is that few producers, so far, are selling their honey or holding it for the government. The larger buyers do not like the plan because they must pay more. The small producer-distributors are doing well. Some think most of the best grades of honey will be cleaned up by the first of the year. For once that might be a good thing, even if it did put some distributors in a spot until new crops come. Might be too bad for the housewife who is beginning to like honey. In the long run maybe this industry would awaken enough to see that we have tremendous markets that only need constant stimulation. And we have a product that in all ways is Nature's finest sweet.

The Behavior of Wintering—

(Continued from page 412)

particularly if in need of a flight. This is indicated by the tendency of the cluster temperatures to increase with this pre-flight stimulus, but more with actual flight. Then with flight cessation and a decrease in the outside temperature, the temperature of the cluster will drop until a normal condition is again reached within the cluster, whereupon the inverse relation of changes will then follow. Disturbances will give a similar response, as will a temperature of 50° F. or above in a bee cellar.

The accompanying photograph shows the temperatures recorded in five colonies of bees with variable winter protection at Madison, Wisconsin, in December-January, 1923-1924. As each 10-frame hive was provided with 44 electrical thermometers (thermocouples) the determination of the temperature of a large number of points within the cluster was possible. While only averages are shown in the figure, it does give a good general idea of cluster reactions to changes in outside temperatures. In general, there were little differences between the responses of unpacked and packed colonies, except a delayed action with the colony with 10½ inches of packing and the occasional inability of unpacked colonies to keep up cluster temperatures when not in contact with stores.

When the 44 temperature readings were plotted on a hive diagram, a general idea of the cluster location was given. In comparing two consecutive readings of the same cluster, if we recorded colder temperature in blue and warmer in red, an exact picture of colony reactions was provided. Excepting occasions previous to, during, and after flight periods, and in a few instances where clusters were not in proper contact with stores, the temperatures in the center of the cluster would show red (warmer) and those on the edge blue (colder) with a drop of the outside temperature, and the reverse with increased outside temperatures. If we could show you these comparative charts, you could not help but agree that the temperature of the edge of the cluster is not maintained at 43-46° F.

An interesting instance of the reaction of a colony cluster not in contact with stores is shown in the graph. The colony without packing showed a highest temperature within the cluster of only 69.1 with an outside temperature of 9.8° F. at 3:44 a.m., Jan. 1, 1924, while at 22.6° F. on January 5 at 7:51 a.m., the highest temperature recorded was 83.0° F. In the first instance, with a sudden drop in the outside temperature, accompanied by a blizzard, the cluster apparently had contracted away from its supply of stores and was unable to maintain its heat production enough to keep the entire cluster warm. This precarious position was improved during the afternoon when with a higher outside temperature, the cluster shifted upward to again contact its stores and then passed safely through the low outside temperature period of 22.6° F. on January 5. Possibly, this is an explanation of the claim sometimes made that a cluster uses less stores at cold than at warmer temperatures. The bees of a cluster cannot consume stores when they are chilled or when they cannot reach them. There is plenty of evidence that unpacked colonies use more stores than protected colonies over a long period of weeks or months when brood rearing is not in progress.

PROGRAM
ALABAMA BEEKEEPERS ASSOC.
Duncan Hall, Auburn, Alabama

1:00-5:00 p. m., October 10, and
8:30-11:00 a. m., October 11

October 10—

1:00 Address of Welcome—Coyt Wilson, Assistant Dean and Director, School of Agriculture, A.P.I.

1:15 Lazy Bees—Edward C. Hanson, President, Alabama Beekeepers Association.

1:30 Honey Advertising—L. O. Brackeen, Publicity Director, A.P.I.

2:00 Marketing of Honey in Alabama—A. W. Jones, Extension Marketing Specialist.

2:30 Alabama Movie on Bees—F. E. Guyton, Professor of Zoology-Entomology, A.P.I.

3:20 Five minutes recess.

3:25 The Results of Two Years Experiment in Pollination of Crimson Clover—G. H. Blake, Jr., Assistant Entomology, Auburn, Alabama.

4:00 Problems Relating to the Use of Bees for Pollination Purposes—W. A. Ruffin, Extension Entomologist, Auburn, Alabama.

4:30 Symposium on Producing and Processing Honey:

1. H. C. Short, Package, Queen, and Honey Producer, Fitzpatrick, Alabama—5 minutes.

2. J. F. McVay, Package, Queen, and Honey Producer, Jackson, Alabama—5 minutes.

3. Clinton Berry, Package, Queen, and Honey Producer, Montgomery, Alabama—5 minutes.

Adjourn until 8:30 Saturday morning, October 11.

October 11—

8:30 Address, Beekeeping in Alabama—Frank Stewart, Commissioner of Agriculture, Montgomery, Alabama.

8:45 Alabama Apiary Law:

1. George Miller, Attorney, State Department of Agriculture—Present Contents of the Law—15 minutes.

2. W. E. Harrell, Package, Queen, and Honey Producer, Hayneville, Alabama — Desirable Changes in Law—15 minutes.

3. Howard Scott, Attorney; Package, Queen, and Honey Producer, Chatom, Alabama—15 minutes.

9:30 Movie, "Bees"—Earl Kennamer, Wildlife Extension Specialist, Auburn, Alabama.

10:00 Honey Plants of the South—Frank Robinson, Specialist in Testing Honey Plants for State of Florida, Gainesville, Florida.

Football—Auburn and Wofford—Saturday, October 11, 2 p. m.

F. E. Guyton, Sec'y

Connecticut Beekeepers Assoc.
Hartford, October 18

The next meeting of the Connecticut Beekeepers Assn. will be held on the third Saturday of October which is October 18, 1952. The place is the Y. M. C. A., corner of Pearl and Jewel streets, northeast of the State Capitol, Hartford, Conn.

The program will be an all day meeting with a speaker for the morning and afternoon sessions.

A feature of the program will be the "Honey Cookery" contest. This will be under the supervision of the Ladies Auxiliary. Prizes will be offered for each of the various classes. It is urged that the men take an active part in this contest.

Several prizes will be offered for guessing correctly different varieties of honey on display.

The noon meal for the day may be purchased in the dining room of the Y. M. C. A.

All beekeepers are invited to attend; out-of-state beekeepers who may be passing through are welcome.

Philemon J. Hewitt, Jr., Publicity

Westchester Co. Beekeepers Assoc.
Tuckahoe, N. Y., October 19

The Westchester County Beekeepers' Association will hold its next meeting on Sunday, Oct. 19, at 2:30 P. M. at the home of Harold McConaghy, on Manor Dr. off Grandview Blvd. next to School 28, Colonial Heights, Tuckahoe, N. Y. Hives will be opened and inspected. All beekeepers and their friends are welcome.

Carlton M. Slater, Publicity

California Beekeeping Short Course
Santa Ana, November 10-15

The University of California, at Davis, will give a short course in beekeeping November 10 through November 15. Arrangements have been made by H. E. Wahlberg, Orange County Farm Adviser, with Dr. Daniel McNaughton, Director of Santa Ana College for the use of a meeting place at Santa Ana College in Santa Ana.

The program will consist of lectures, demonstrations and discussions of the anatomy, physiology and behavior of bees as well as discussions of practical beekeeping. The morning sessions will start at nine o'clock. No formal pre-registration is necessary.

This short course will be the first offered by the University of California in several years and results from requests from beekeepers in southern California counties.

J. E. Eckert, Apiculturist
Davis, California

St. Clair Beekeepers Assoc.

Meetings of the association have been changed from the first Wednesday to the first Monday of each month, the time and place remain the same—8 p. m. at the County Highway Building, Belleville, Illinois.

L. M. Leiper, Sec'y.

American Bee Breeders and
Southern Beekeeping Federation
Baton Rouge, December 1-2

These organizations will meet at the State Capitol in Baton Rouge during December 1 and 2. Much attention has been given to the subjects to be discussed and we promise a very interesting program during the two days. Our aim is to consider the expenses and we believe that we have been able to trim the cost of attending such meetings to a minimum. All are invited to attend and work together to solve the many problems the industry is facing today. We are offering a great opportunity at LOW COST, so please join us.

J. W. Newton, Chairman
Program Committee

Annual Convention
Indiana State Beekeepers Assoc.
Indianapolis, October 25

The Forty-fourth Annual Convention of the Indiana State Beekeepers Association will be held Saturday, October 25, 1952, at the Hotel Riley, 16th St. at Capitol in Indianapolis.

This will be a one-day meeting beginning at 9:00 A. M. with Truman E. Young, president, presiding. There will be a noon day luncheon at the hotel. The program has not been entirely completed at this writing.

The ladies' auxiliary, the Hoosier Honeys, will hold their first regular annual meeting since organization at the 1951 convention. A part of their program and their business session will be held separate from the general sessions of the convention. Mrs. Elouise Young, president, will preside.

Gilbert Perigo, Sec'y.

Middlesex Co. Beekeepers' Assoc.
Waltham, Mass., October 25

The MIDDLESEX COUNTY BEEKEEPERS ASSOCIATION (MASS.) will hold their first indoor meeting of the season at the STATE OF MASS. EXPERIMENTAL STATION, Waltham, Mass., October 25, 1952 starting at 6 P. M. with a catered dinner to be followed by the showing of colored slides depicting the happenings at all the outdoor spring and summer meetings.

Plans are to be formulated to carry on the work started for the tie-in with the U. S. D. A. for the all-out drive for NATIONAL HONEY WEEK and many of the new favorite HONEY recipe file boxes have been distributed to the members and friends and our committee will appear on both Radio and TV, as well as at other meetings.

Full cooperation has been worked out with Mr. Harry Watling, the district officer in charge of the Food Division of U. S. D. A.

John H. Furber, Sec'y.

Virginia Beekeepers Association
Lynchburg, August 7

The Virginia Beekeepers' Association held its annual picnic and business sessions in Miller Park, Lynchburg, Virginia, August 7th, with representatives from five sections of the Old Dominion.

C. H. Pirkey of Charlottesville, president of the association, presided at the afternoon sessions assisted by John M. Amos of VPI, Blacksburg, secretary.

The annual gathering featured Henry Weatherford, State Bee Inspector from Vernon Hill, Va., who addressed the group on, "The Bee Disease Situation in Virginia," and Dr. George H. Rea, former professor of apiculture at the University of Pa. Extension and Cornell University, discussed the topic of "Beekeeping," which was of special interest.

W. C. Garbee was also elected treasurer of the Va. State Beekeepers' Association.

Conrad A. Drexel
Public Relations Director

Georgia State Beekeepers Assoc.
Homerville, October 14-15

Georgia State Beekeepers Association will hold their meeting at Homerville, Ga. on October 14 and 15.

J. H. Girardeau, Jr., Sec'y.

The Bee Man from Iran

The American Bee Journal office recently had the pleasure of a visit by Mr. S. Mohammed Madany, Commissioner of Apiculture, Agricultural Engineering, and Poultry, Ministry of Agriculture of Iran. Mr. Madany is in this country under the Point 4 program to observe and study agricultural management and production practices with particular emphasis on beekeeping, poultry and farm mechanization, for the purpose of improving these fields of endeavor in his country. In addition to his high government position, Mr. Madany owns and manages 2000 colonies of honey bees and operates a small factory manufacturing beekeeping equipment.

Iran is a country more than twice as large as Texas, lying between the Caspian Sea and Soviet Russia on the north and the Persian Gulf and the Arabian Sea on the south, with Turkey and Iraq to the west and Afghanistan and Pakistan to the east. Its geography ranges from deserts in the south to snow-covered mountain ranges in the north, and its climate is only somewhat more moderate than our own. Bee pasture is not as plentiful as in America and commercial beekeeping largely is confined to the irrigated sections and the mountain areas.

Iran has about a million colonies of honey bees. It is surprising to learn that they have some 30 to 40 men who own and operate between 5000 and 6000 colonies. Honey production is estimated at between 10 and 20 million pounds annually. Since their population is something over 15 million, their per capita production is less than in the United States. Because they do not have sugar cane and refined sugar is scarce, honey is in demand and substantial quantities of honey are imported. Most of the honey produced in Iran is consumed in comb form.

It is difficult for us to understand that beekeeping knowledge and lore in a country like Iran, dates back many, many more centuries than does our own. In many cases, this knowledge of the bees has been handed down by word of mouth from generation to generation. About the turn of the present century, Iran began to modernize its beekeeping practices and methods but, even today, many colonies of honey bees are kept in straw skeps, box hives, and earthen ones. Iran now plans an extensive and active program of modernizing beekeeping throughout the land.

One does not want to give the impression that beekeeping is backward in Iran. Commercial beekeeping is conducted mainly in movable-frame hives of many descriptions. These include the Dadant, Langstroth, and English type hives, as well as the long Russian hives which contain from 18 to 20 movable frames.

Our pleasant and interesting two days spent with Mr. Madany brought us a much better picture of beekeeping in other parts of the world, and left us with the conviction that the beekeeping affairs and the modernization program of Iran are in capable and worthy hands.

Mr. Madany, standing beside the beehive and not facing the camera, is explaining bee behavior and beekeeping methods to Mulla Kashani and his staff. Mulla Kashani, in turban third from the right, is the religious leader of 80 million Iranians and recently was elected President of the Congress of Iran.

Management for Successful Wintering—

(Continued from page 414)

improper organization or light colored combs in the top hive body. Remember, the bees will consume much of the honey you leave in the lower chambers in the fall.

It is preferable that colonies be located where they receive maximum sunshine, protection from the wind, and have good air drainage away from the hives. Improper choice of apiary sites is frequently responsible for poor wintering. The bottom-board entrance should be reduced to a small opening and an entrance into the upper hive body provided by an auger hole or other means. Locations and hive entrances that favor winter flights provide a beneficial check against an excessive build-up of Nosema infections.

Few colonies have adequate pollen reserves to permit normal brood rearing during late winter and early spring. The feeding of expeller-processed soybean flour mixed with pollen and sugar sirup will enhance colony development so that the colonies can raise young bees faster than their populations are depleted by any Nosema infections present. Furthermore, where colonies survive with large populations of young bees before new pollen becomes available, they frequently replace their winter consumption with new honey from willow, dandelion, and other early sources while inferior colonies continue to consume more than they gather. The colonies that consume the largest amount of stores between October and April 1 will show the greatest net surplus over a 12-months' period. The beekeepers' profits are determined by net surplus—not by how little honey the bees can winter on.

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Box 286
Davis, California

Crop and Market

by M. G. Dadant

Crop Compared to 1951

There is not much change in the crop picture since the September report except that it appears a little more optimistic in some areas. More of the honey now is off the hives and much of it has been extracted.

As cited previously, combinations of unfavorable weather ranging from wet and cool conditions earlier to dry conditions later on, resulted in belts where the honey crop was not as large as last year. From Vermont, New York and New Jersey west through Ohio, Michigan, Indiana, southern Illinois, Missouri, Kansas, parts of Nebraska and Oklahoma the crop generally has been less than in 1951. In the East, however, New Hampshire reports a much better crop and Maryland reports 20 per cent more honey but dark in color. Parts of Indiana, Illinois and Nebraska report crops equal to or better than 1951.

The dry spell throughout the South generally has resulted in light crops through Alabama, Georgia, Mississippi, and extending into Texas. Florida reports a little more honey than in 1951, ranging from a reported 15 to 50 per cent more.

Iowa, Minnesota and Wisconsin report better crops ranging from only slightly better to more than twice as much as in 1951. Utah, western Colorado, and California report better crops; and New Mexico, Montana, South Dakota and Oregon report crops about average or somewhat less than last year. Eastern Colorado's crop was not as good due to drought. In general, Canada reports a honey crop about 60 per cent of last year although Saskatchewan reports a good production.

Any More to be Gathered?

The very northern parts of the United States now report that the flow is over with little or no prospects for more. New York, New Jersey, Massachusetts, Maryland and vicinity report some honey from goldenrod and aster if frost does not come. Thoroughout the central area between the extreme North and the South reports vary all the way from light flows to none at all. It would appear that generally bees are not doing much more than making a living and that there is no promise for a big fall flow in this entire area. In the South from east to west, reports say that there still is some honey being gathered.

Condition of Bees for Winter

Colonies over the country, as well as in Canada, are generally in excellent condition to go into the winter. It is only in areas where late drought has persisted that we have reports that colonies are not in good shape for this time of the year. New Hampshire, Massachusetts and Texas report conditions below normal and Illinois reports that some colonies will have to be fed.

Honey Plant Conditions

Except in areas where late rains have not improved conditions and drought has persisted, our reporters say honey plant conditions are good. Only in Florida, Mississippi and Texas do we have discouraging reports. Undoubtedly there are other areas which have not been reported. On the other hand, many states and provinces of Canada report honey plant conditions excellent. It is apparent that in many of the earlier drought areas, late rains have somewhat improved plant conditions.

Local Retail Prices

In eastern markets, 1-pound jars of liquid honey mostly are selling from 30 to 40 cents each; 5-pound liquid from $1.25 to $1.50; 1-pound bulk comb from 40 to 45 cents; 5-pound bulk comb from $1.75 to $2.00; and section comb honey ranges all the way from 45 to 65 cents depending on quality, we presume.

In the rest of the country, prices generally tend to be lower and appear to vary quite widely regardless of geographical location or crop conditions. For example, 1-pound jars of liquid honey mostly range between 30 and 35 cents although several report prices as low as 25 cents and a few report prices higher than 35 cents. The 5-pound liquid packs generally are selling from $1.00 to $1.25 with an average price of $1.15 being rather well maintained. Here again some sales are reported both below and above these amounts. Bulk comb honey mostly is selling between 35 and 45 cents for the 1-pound and anywhere from $1.10 to $1.80 for the 5-pound size. Comb honey is selling anywhere from 35 to 50 cents with few exceptions and with most sales being made at the 40 to 45 cent levels.

Wholesale Honey Prices

Producer sales of extracted honey in 60-pound containers across the country are being made at approximately the support levels. A few report sales being made at slightly below, e.g. 11 cents per pound, while a few report sales from 12 to 13 cents. Many honey buyers have been reluctant to purchase more than their normal requirements at these figures. The only evidence we have seen of buyers "going out to buy honey" has been with chunk comb honey and in some cases those who needed good quality liquid honey for bulk comb honey packs. Amber grades generally are selling for from 1 to 2 cents less than white honey.

Any Honey Going Under Loan?

Only a few report honey being put under the PMA loan program, and those reporting only knew of a limited number of producers or lots of honey. By far the large majority of states report that no honey is going into the loan program so far, and a few say that producers do not like the red tape involved in such a procedure. It is our general impression that most are using the price support program as a wedge to obtain the support level or higher for their honey. Finding a reluctance on the part of buyers, they are holding their honey without resorting to loan procedures. It would appear, however, if these producers are unable to make an equitable sale, they will either take out a purchase agreement or place their honey under loan. For Florida, Georgia, So. Carolina, Alabama, Louisiana, Texas, New Mexico, Arizona and California, this must be done before October 31. The rest of the country has until December 31 to do this.

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The Market Place . . .

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CAUCASIAN QUEENS—Best quality, good workers and very gentle. 1 to 25, $1.00 each; 25 up, 90c each. Requeen now and have good hives for next spring. Black River Apiaries, Currie, N. C.

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SHORT'S QUEENS ARE GOOD QUEENS. Try them and you will find their colonies tops in production, gentleness, and free from diseases. Three banded Italians only. Used by leading honey producers for more than 30 years. Requeen now for maximum production next year. $1.00 each; 10, $9.00; 25, $20.00. Prompt shipment. Postpaid. H. C. Short, Fitzpatrick, Ala.

YANCEY HUSTLER QUEENS — Three-band Italians, bred for business. $1.00 each; $10.00 per dozen. All guaranteed. Caney Valley Apiaries, Bay City, Texas.

SELECTED ITALIAN QUEENS 75c each, Caucasian 90c, Carniolans $1.00 each. All queens shipped by Air Mail and guaranteed to please. Walter D. Leverette, P. O. Box 364, Ft. Pierce, Florida.

EAT HONEY—NATURE'S SWEET. Produce it with gentle Caucasians. Write for price on 1953 queens. Tillery Brothers, Greenville, Ala.

FOR SALE

I AM OFFERING my bees, all equipment and my queen rearing business for sale. A real opportunity to the right person. Write for particulars and price. Jay Smith, Rt. 2, Fort Myers, Florida.

HONEY PAILS—5-lb. tin with covers and bails, $9.00 per 100. 5-lb. glass jars with caps and bails, $1.00 dozen. Longfellow Bros., Hallowell, Maine.

FOR SALE—1952 models Electro-Flo filling machines $285.00 f.o.b. Hancock Honey House, Hancock, Iowa.

FOR SALE—New heart cypress 10-frame bottom boards K.D. 10 or more, $1.00 each; 50 or more, 90c each; 100 or more, 85c each. I nailed up sample, postpaid $1.25. Fred L. Poole, Rt. 2, Bx. 67, Elizabethtown, N. C.

500 colonies of bees and all equipment. honey house, modern home, or bees without home or honey house. Would rent honey house. J. T. Camp, Hot Springs, Montana.

IMMEDIATE DISPOSAL — 200 colonies bees, eight dollars each, including shallow extracting supers. Discount entire lot. Factory made hives, heavy for winter. Health certificate furnished. R. E. Weldon, Warrensburg, Mo.

HUNDRED FIFTY COLONIES exceptionally good equipment. All or part. With or without crop. Now or in spring. Never any disease. Reasonable price. Harry Luer, Puxico, Missouri.

1000 colony bee outfit. 500 or more are the Dadant Starline strain. Plenty of everything and everything in No. 1 condition. Combs are built on Dadant's wire foundation. Bogenschutz uncapper new in 1951, 3 45-frame Simplicity extractors, 2 Brand melters, etc. Honey house can be had if desired. Interested parties invited to visit while it is in operation. Byron Aldrich, Moneta, Iowa.

Copy for this department must reach us not later than the tenth of each month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

Rate of Classified advertising—13 cents for each word, letter, figure or initial, including the name and address. Minimum ad, ten words.

As a measure of precaution to our readers we require reference of all new advertisers. To save time, please send the name of your bank and other references with your copy.

Advertisers offering used equipment or bees on comb must guarantee them free from disease or certificate of inspection from authorized inspector. The conditions should be stated to insure that buyer is fully informed.

WANTED — RETIREMENT. Am offering Miss. and S. Dak. approved disease free bees, with two operational units and all equipment for honey production, at Gary and Bruce, S. Dak., for sale, honey basis or share cropping basis to right man or men. Good sweet clover and white Dutch clover territory. Some fall buckwheat. Migratory operations, two good International transportation trucks. Bees wintering in Miss. for spring return. For further particulars address Box 100, c/o American Bee Journal.

FOR SALE BEES — 1500 colony outfit. Home and honey house if desired. H. A. Hansen, Box 193, Snyder, Nebraska.

HONEY and BEESWAX WANTED

CARLOADS or less bottling honey. Cans furnished or exchanged if wanted. Send samples to Honeymoon Products Co., 39 E. Henry St., River Rouge, Michigan.

CASH PAID for honey in all grades. Submit samples. Schultz Honey Farms, Ripon, Wisconsin.

WANTED — Extracted honey, white or light amber, in 60's. State price in first letter. Ed. Heldt, 1004 W. Washington St., Bloomington, Illinois.

WRITE FOR SHIPPING TAGS and current quotations on rendered beeswax. Any amount from one pound up bought. If you have 25 pounds or more, save 25% by letting us work it into foundation for you. Walter T. Kelley Co., Paducah, Kentucky.

HONEY WANTED—All grades and varieties. Highest cash prices paid. Mail samples. State quantity. HAMILTON & COMPANY, 1360 Produce Street, Los Angeles, California.

WANTED—All grades comb and extracted honey, large or small amounts. Quote price in first letter. Mail sample. King Honey Co., 4308-10-12 E. Truman Road, Kansas City, Mo.

CARLOADS or less of honey and wax. Send sample and price. Alexander Co., 819 Reynolds, Toledo, Ohio.

WANTED—3 carloads of buckwheat honey, 2 carloads of Florida orange blossom honey in barrels or cans, 2 carloads of southwestern alfalfa or cotton honey. Cash and top prices. Alexander Company, 819 Reynolds Road, Toledo, Ohio.

WANTED—Extra white and light amber honey. Let us ship you the containers. Sell us your honey for CASH on delivery. The Hubbard Apiaries, Manufacturers of Bee Supplies and Comb Foundation, Onsted, Michigan.

CASH PAID for white and amber extracted honey. Send samples and state quantity available. Prairie View Honey Co., 12303 Twelfth St., Detroit 6, Mich.

WANTED — Good quality honey in 60's. Send sample. Quote price. Clearbrook Honey Farms, Clearbrook, Minnesota.

WANTED—Cut-comb and strained. Send samples and price. Cole Honey Co., 4480 Piedmont Ave., Oakland, Calif.

WANTED—Honey, amber or white. Mail samples and state quantity. No buckwheat. Holland Honey Cake Co., Holland, Mich.

HONEY FOR SALE

NEW CROP finest quality light table honey. Orange-palmetto, saw palmetto and mangrove, 11c per lb. in 55-gal. steel drums; $8.50 per 60-lb. can; $8.00 each, three or more cans. All f.o.b. here. F. H. Nelson, Murdock, Fla.

TRUCKLOADS clover honey in sixties. Walter Roose, Sac City, Iowa.

ANY GRADE — any amount. Alexander Company, 819 Reynolds, Toledo, Ohio.

CLOVER EXTRACTED HONEY in sixties. Ralph Gamber, 910 State, Lancaster, Pennsylvania.

HONEY, white clover, 18c per lb. 5 sixties or more, 17c. Satisfaction guaranteed. Lose Brothers, 206 E. Jefferson, Louisville, Ky.

CLOVER EXTRACTED HONEY in sixties, and five, three, one pound glass. Elmer Luebeck, Essex, Illinois.

SUPPLIES

WRITE FOR CATALOGUE. Quality bee supplies at factory prices. Prompt shipment. Satisfaction guaranteed. The Hubbard Apiaries, Manufacturers of Beekeepers' Supplies, Onsted, Michigan.

THE BIGGEST BEE SUPPLY CATALOGUE PUBLISHED (64 pages) free for the asking. Big factory manufacturing a complete line of wooden goods, comb foundation, metal goods, veils and gloves, carloads in stock, daily shipments, save 20%. WALTER T. KELLEY CO., PADUCAH, KENTUCKY.

THE ONLY COMB FOUNDATION PLANT in the East. We sell foundation, work your wax, render combs and cappings. Robinson's Wax Works, Rt. No. 3, Auburn, New York.

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SOUTHERN CALIFORNIA HEADQUARTERS for Bee Supplies. Make our facilities your "Trading Post." Complete stocks. See our Bulletin Board for Budget Bargains. The Diamond Match Company, 1300 Produce St., Los Angeles 21, Calif.

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FOR SALE—My Weed process foundation outfit consisting of sheeter, mills, vats, boiler. Capacity of 100 to 200 lbs. medium brood foundation per hour. Price $2750.00. Fred Peterson, Alden, Iowa.

POSITION AND HELP WANTED

APPLICATIONS WANTED for year around work in commercial beekeeping. Give experience, age, and salary details in first letter. York Bee Company, Jesup, Georgia.

WANTED — One fully experienced queen breeder and one general helper for next season. Give age, experience, references and salary expected. Start work February 1st. Florida Bee & Honey Company, 2649 Raeford Road, Orlando, Fla.

WANTED—One experienced and one inexperienced man for 1953. Must give references. Steady work for the right man. Howard Weaver, Navasota, Texas.

WANTED

WANTED—Eight frame, full depth hive bodies. With or without drawn combs. Also need a Benson electric uncapping plane in good condition. Box 308, Valentine, Nebraska.

SEEDS AND TREES

SWEET CLOVERS FOR BEEKEEPERS—Ohio evergreen long blooming sweet clover, Madrid and white and yellow blossom clovers. W. B. Johnston Down Town Store, Box 208, Enid, Okla.

HONEY PLANTS our specialty. Catalogue on request. Pellett Gardens, Atlantic, Iowa.

MISCELLANEOUS

KNOW interesting facts concerning the bees of India through the INDIAN BEE JOURNAL, published in English, by the Bhupen Apiaries (Himalayas), Ramgarh, Dist. Nainital, U.P., India, and obtainable from them. Subs. Rs. 7/-or 10 Shillings or $2.25 per annum. Single copy Rs. ¼-a. 1/9 or 45 cents (international money order). Payment in mint postage stamps of your country accepted.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912 AND MARCH 3, 1933 of American Bee Journal, published monthly at Hamilton, Illinois, September 1, 1952.

STATE OF ILLINOIS
County of Hancock—ss.

Before me, a notary public in and for the state and county aforesaid, personally appeared M. G. Dadant, who, having been duly sworn according to law, deposes and says that he is the business manager of the American Bee Journal and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the name and addresses of the publishers, editors, and business managers are:

Publishers: American Bee Journal, Hamilton, Illinois.

Editors: G. H. Cale, Hamilton, Ill., M. G. Dadant, Hamilton, Ill., A. Fraser, Hamilton, Ill., R. A. Grout, Hamilton, Ill.

Business Manager: M. G. Dadant, Hamilton, Ill.

2. That the owners are: Dadant & Sons, Inc., Hamilton, Ill.

3. That the known bondholders, mortgagees and other security holders owning or holding one per cent or more of the total amount of bonds, mortgages, or other securities are:

Stockholders:
H. C. Dadant, Hamilton, Ill.
M. G. Dadant, Hamilton, Ill.
L. C. Dadant, Hamilton, Ill.
J. C. Dadant, Hamilton, Ill.
R. H. Dadant, Hamilton, Ill.
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4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears and upon the books of the company as trustees or in any other fiduciary relation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

(Signed) M. G. Dadant,
Business Manager American Bee Journal.

Sworn to and subscribed before me this 22d day of August, 1952.

Frances Rowe, Notary Public

My commission expires August 1, 1956.

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